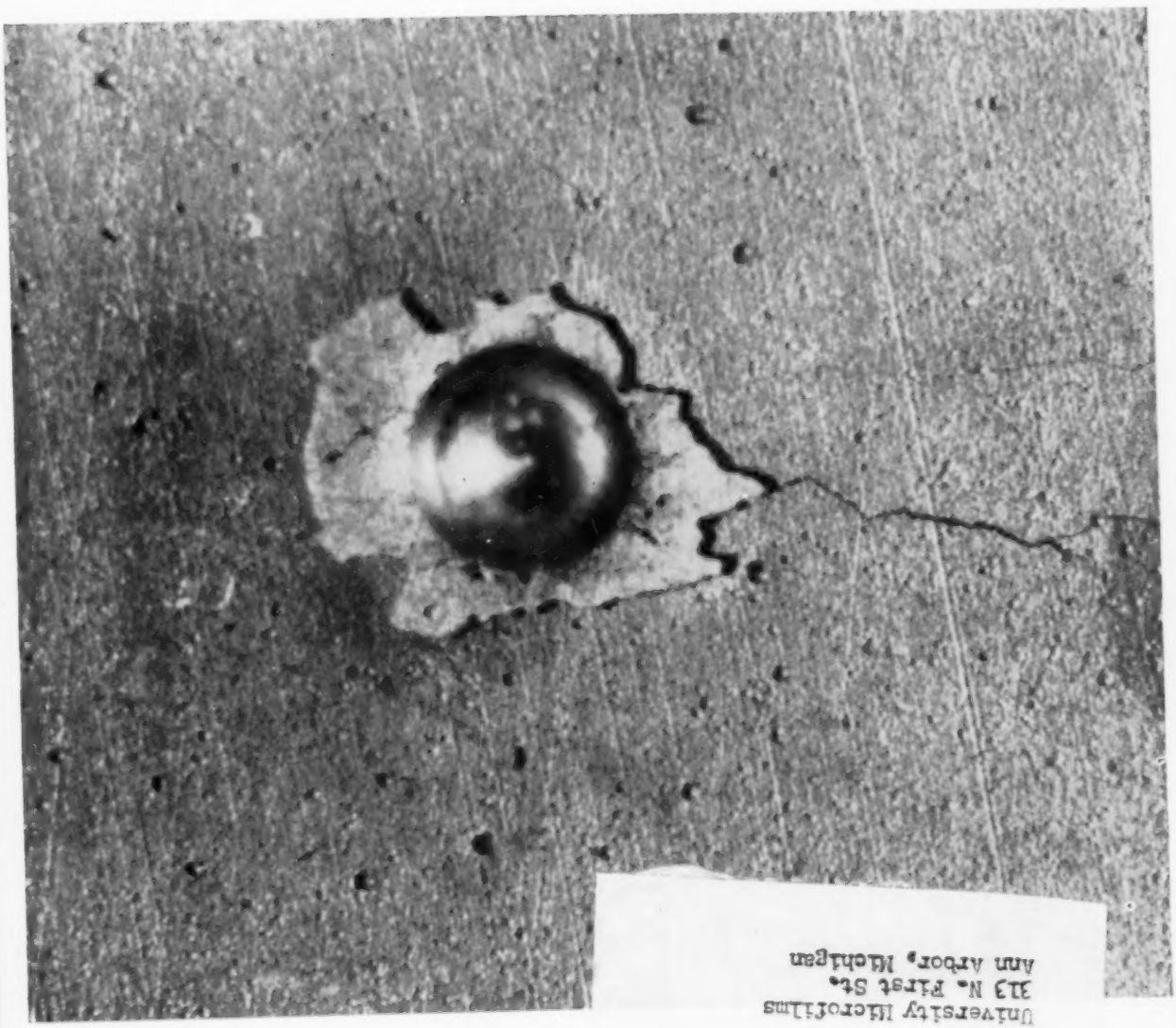
JULY 1956

plating

JOURNAL OF THE AMERICAN ELECTROPLATERS' SOCIETY



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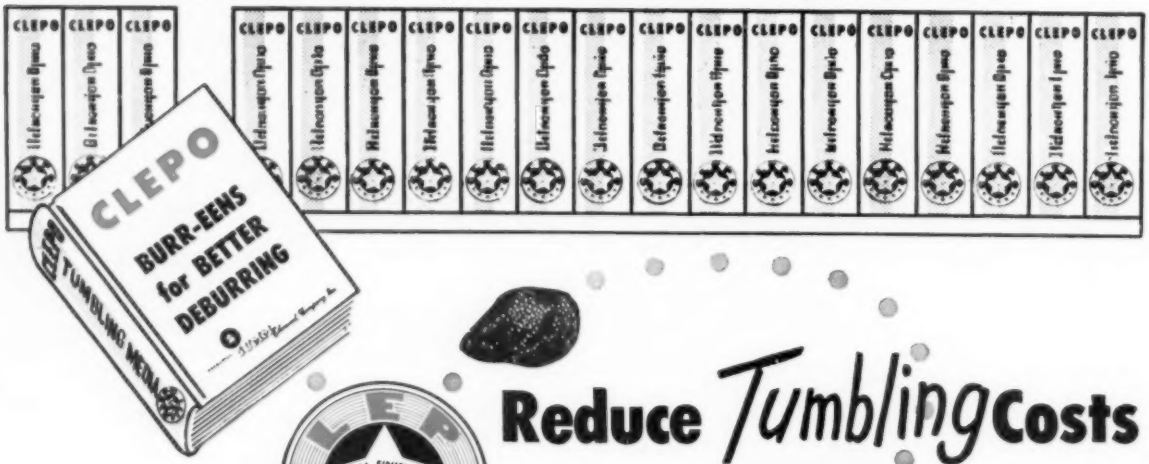

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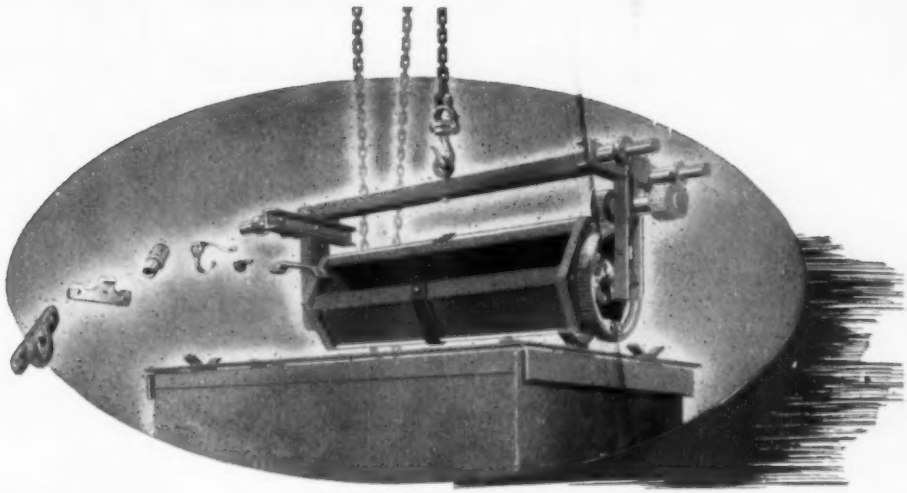

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AN AUTOMATIC MACHINE FOR EVERY METAL FINISHING NEED

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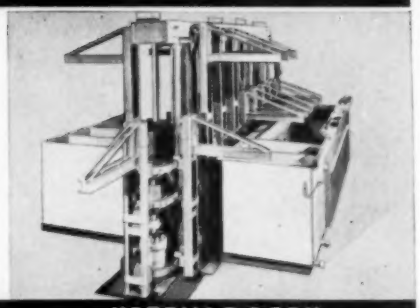
Rack Type Machine

Low initial and low operating costs are features of this newly introduced small automatic which has a big capacity for its size. ←



"STEVADOER"
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Unit's load capacity, mechanical flexibility and lift design meet tomorrow's increased safety and production requirements. →

MODEL "A"
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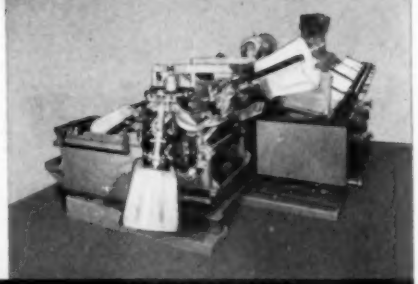
A compact automatic processing machine, embodying the famous Stevens auxiliary cam shaft and lifters for rapid vertical transfer. ←



MODEL "C"
Barrel Type Machine

A proven automatic barrel machine for plating and processing small parts. Only unit with fully automatic load and unload features. →

MODEL "B"
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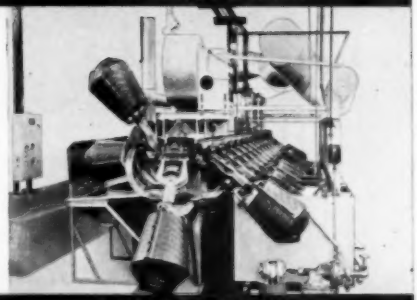
Features rapid, continuous movement processing employing hump type cams. Design permits utmost mechanical and cycle flexibility. ←



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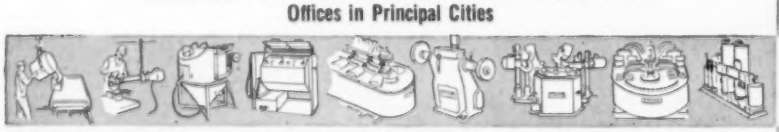

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Journal of the American Electroplaters' Society

July 1956 **Vol. 43, No. 7**

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SOCIETY of BUSINESS MAGAZINE EDITORS

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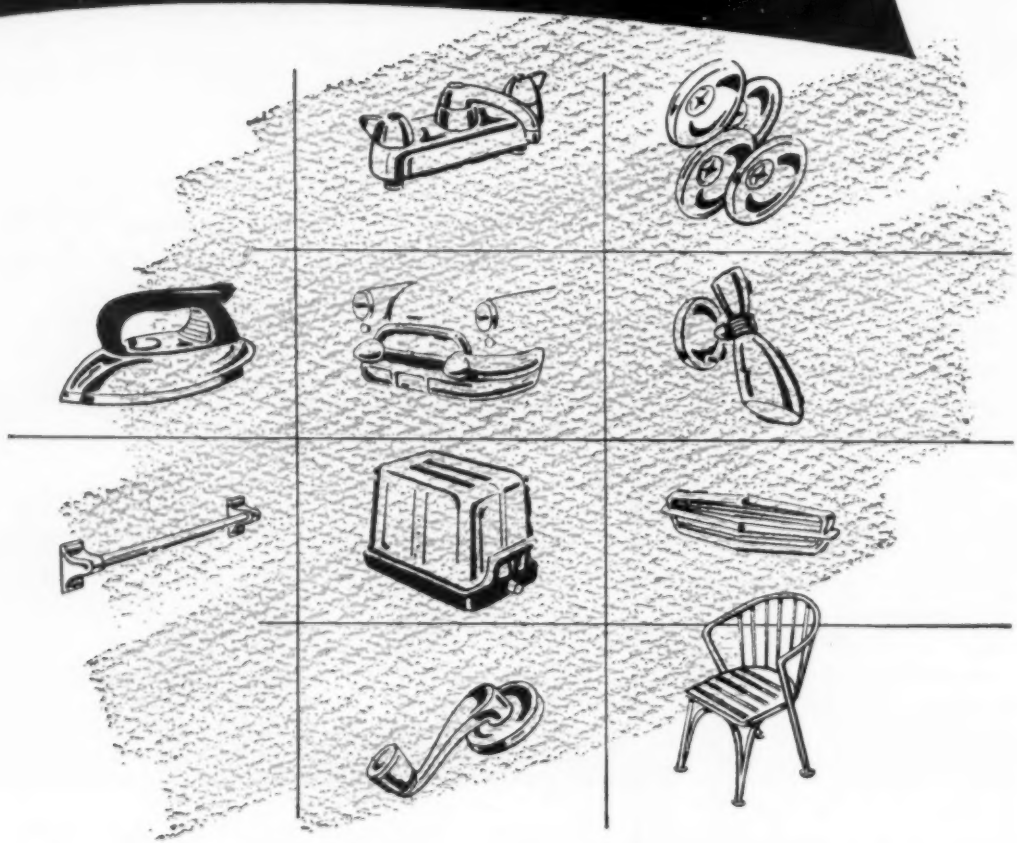

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PEOPLE

In the intricate complication of modern life, there is a tendency to think in terms of social groups. Hence, GM becomes a special entity in the minds of most people who use the term. The same applies to GE, SEC, AES, etc. And yet, all of these groups taken singly or together are made up of people and the relations between people.

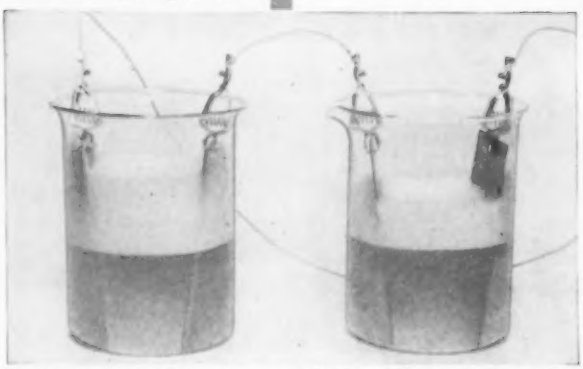
The AES is a case in point. Men who learn something from their experience in their profession meet with other men and relate to them their new information. In this manner, all the people who belong to the AES gain and contribute. This matter of contributing to a common fund of knowledge is an element which presses the whole forward through the enlightenment of the individuals.

Our recent convention was the ultimate embodiment of this Society's functionings. There, men met and shared technical knowledge, business experiences, hopes and fears for the future. There, women met with other women and with men to share the reactions and the experiences gained in the distaff side of the technico-business field which influences all of them mutually.

In all these matters, the organization of the AES was the mere framework within which people met and people reacted. It is sometimes of value to remember that no matter how large or potent our organization may become, it all depends on people.

THE EDITOR

Pre-cleaning for Barrel Plating Lines



DIFFERENCES IN FOAM BUILD-UP *developed by two different electrocleaners are shown above. Beaker at left contains a conventional electrocleaner in general use: beaker at right contains Diversey No. 12 electrocleaner. A current of 125 amps per sq. ft. on work is sent simultaneously through each beaker. Ordinary electrocleaner (left) produces a thick, heavy foam blanket which, in your cleaning tanks, would trap an explosive mixture of hydrogen and oxygen gases. In Diversey No. 12 electrocleaner (right) foam blanket is properly controlled . . . this is your guard against explosion dangers* and *solution spray.*

How to control foaming and

GUARD AGAINST EXPLOSION DANGERS

in electrocleaning

Excessive foam build-up in the electrocleaner tank always creates a danger of explosion caused by build-up of trapped hydrogen and oxygen gases. In barrel plating, this excessive foam build-up is increased by the agitation of the solution as barrels are rotated.

Even under extreme agitation conditions, Diversey No. 12 electrocleaner not only minimizes the explosion hazard but produces superior cleaning as well. Due to its high current-carrying capacity, this improved electrocleaner is exceptionally fast-acting on all types of contamination. And its high contamination capacity means longer periods between dumpings.

FREE-RINSING, NON-CAUSTIC SOAK CLEANER

In barrel cleaning, excessive solution is carried over from soak tanks to electrocleaning tanks. The result is two costly problems: (1) excessive carry-out means higher soak cleaner consumption; (2) carry-over of soil-laden solutions shortens electrocleaner life. Diversey No. 404 soak cleaner was specifically developed with extraordinary wetting action and water softening properties. Since these two factors combine to give faster rinsing and draining, No. 404 assures you a more efficient use of both soak and electrocleaning solutions. Soak cleaning solutions drain back into soak tank or are rinsed free. Upkeep costs are reduced, solution life is increased, carry-out is minimized.

Better wetting action also means better cleaning. Since immersion time in soak cleaner is limited, No. 404's fast-wetting (soil penetration) leaves more time in the cycle for actual cleaning. This is another reason why No. 404 removes the toughest contamination.

For free illustrated brochures on Diversey metal cleaners, write Metal Industries Department, The Diversey Corporation, 1820 Roscoe St., Chicago 13, Illinois.

COVER STORY

THE FRIED EGG PROFILE

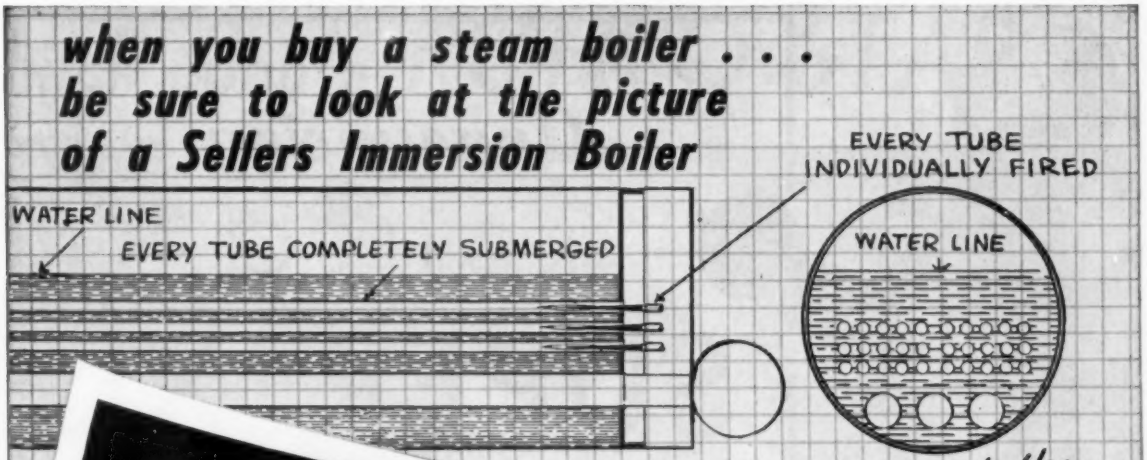
Tests are measures of accomplishment. In the field of electro-deposition, tests are used for the determination of physical or chemical properties of plate in relation to basis metal. Although many tests are destructive and are therefore undesirable in a finished product, some of the same destructive type tests have been adapted to production methods.

"That there is a need for nondestructive tests for adhesion of electrodeposits is well established." Dr. Hyman Chessin and John G. Poor start their article in this issue with that statement. In their article, too, is to be found a group of illustrations which show the product of a minimum destruction test for the adhesion of hard chromium deposits. These take the form of dimples, spalled swellings, etc. By far the most interesting of them all is the one designated 2D. This one appears on our cover. The spalling and the primary indentation remind one, in this picture, of a fried egg; and, like an egg, the practiced eye can tell by inspection the condition of the egg. Yet, from this simple photograph, the authors are able to draw conclusions about the quality of the plate. The simplicity of the test, its low magnification observation and the simplicity of a method applicable to product items where a small indention may be tolerated is attractive. It makes an excellent illustration and one easily understood.

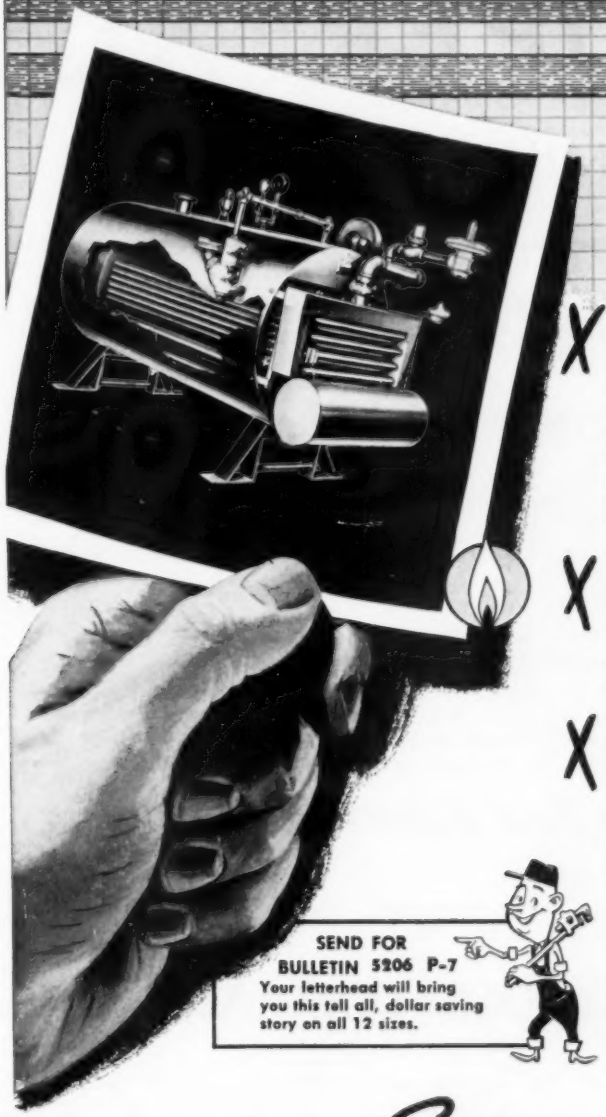
The printed name bestowed by one of our assistant editors—"Fried Egg Profile"—reminds one of the late John Barrymore's allusion to the left side of his face. The difference is in the type of test to which it refers.

THE EDITOR

when you buy a steam boiler . . . be sure to look at the picture of a Sellers Immersion Boiler



There's no other boiler like a Sellers—



every square foot of heating surface is water backed— —100% effective!

The long, individually gas fired tubes in the Sellers Immersion Boiler are all completely submerged nearer the water level—and over the return tubes! Heat is therefore uniformly distributed through them—and directly into the water—no where else!

there's no scale problem!

In immersion heating, the needed long tubes expand and contract sufficiently on intermittent firing to crack loose any hard scale that forms on the tubes. This practically eliminates the scale problem, makes maintenance simpler and increases the boiler's efficiency.

the average flue gas travel is 15 feet!

Maximum, almost complete utilization of the exhaust heat is assured with a Sellers Immersion Boiler. This is a result of Sellers exclusive design—with the firing tubes completely submerged and *located over the return tubes*, there is a long, slow flue gas travel—an average of 15 feet! Heat can only go into the water.

There's no other steam boiler like a Sellers Immersion Steam Boiler. Its simple design gives you a package boiler unit with many other outstanding features. Minimum maintenance and maximum efficiency combine to give you years of remarkably low operating costs. Twelve sizes available!

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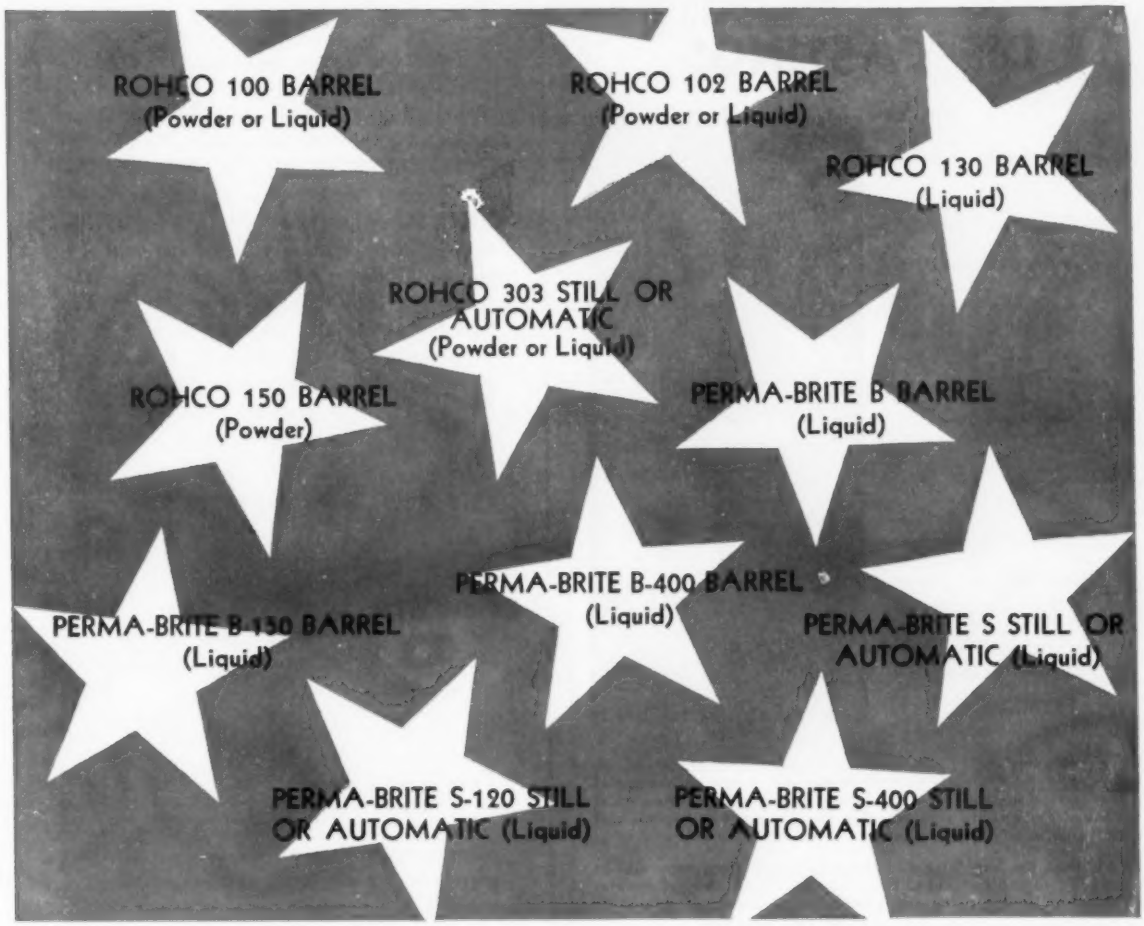

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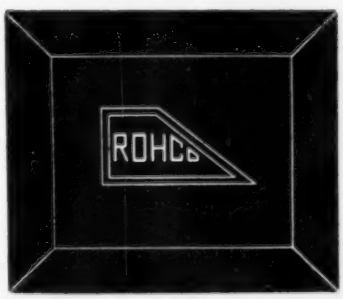

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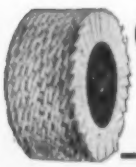
Exceptionally fast
cutting action
—no streaking

Developed specifically for buffing die castings. Each section of this Churchill Type #150 DN is made with a double row of overlapped and staggered fingers. This specialized construction allows a great flexibility to working surfaces and thereby gives a smooth and uniform finish to irregular shapes.

In addition, the buff fingers of the adjacent sections meld and fit compactly together. Thus, the #150 DN absolutely eliminates all streaking and gouging and gives the best finish obtainable on die castings.

If you are buffing die castings, we believe these #150 DN Churchill Finger-Buffs* merit a trial in your buffing room.

- Churchill Finger-Buffs* are competitively priced. Produced in all sizes from 4" to 21" diameters. For complete information write your problem.



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Twenty-five Years Ago

Twenty-five years ago, the AES Convention was held in Rochester, N. Y. from June 29–30—July 1–2 and was opened with an address by the founder, Charles H. Proctor. In his address, he reviewed the progress of the Society since its inception April 10, 1908. From the looks of it, it was a highly successful convention with educational sessions each day. At the final session of the Convention on Thursday afternoon, Philip Sievering took office as Supreme President. Walter Barrows of the Toronto Branch was presented the founders gold medal by Dr. Blum. The 19th Annual Convention of the AES was a tremendous success.

In this July 1931 issue, W. H. Phillips had an article entitled, "Further Developments on Low pH Nickel Plating," which was presented before the Birmingham Branch some time before. In the issue also is included the Secretary-Treasurer's report for the year. Needless to say, the amounts involved would not operate the present AES for a month.

Ten Years Ago

Ten years ago, the July 1946 issue of the MONTHLY REVIEW contained abstracts of the papers presented at the 33rd Annual Convention. Eleven papers were presented and pictures and biographical notes were run on the National Officers, to wit: Frank K. Savage, President; Kenneth M. Huston, First Vice-President; Samuel S. Johnston, Second Vice-President; Arthur W. Logozzo, Third Vice-President and Walter L. Pinner, Past President.

A thorough report of the Convention was carried under Convention Highlights. The International Fellowship Club (an organization of supply house representatives) used an entire page and featured a picture of Thomas A. Trumbour, who remained its permanent Secretary.

This issue of the MONTHLY REVIEW contained 100 pages with a good amount of activities and was generally a book of fair standing.

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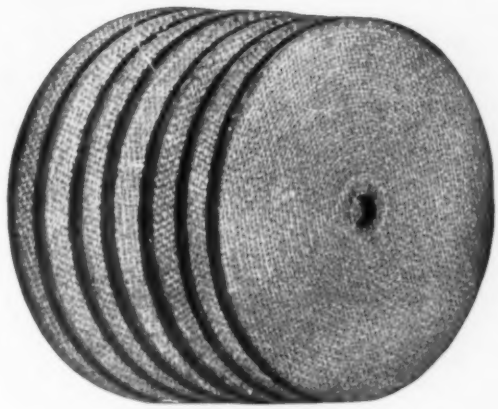

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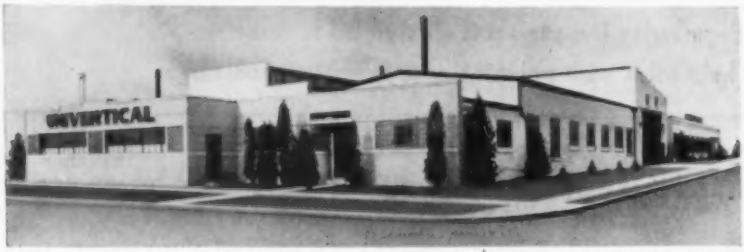


Expansion—Univertical Foundry and Machine Company, Detroit, has just completed a major expansion of its office and plant facilities at 14841 Meyers Road, which brings total manufacturing and yard space to 42,000 sq ft, equipped with three-car rail siding.

The expansion featured the installation of five, one-ton Detroit Rocking Electric Furnaces and three one-ton gas fired furnaces. The electric furnaces for the production of nickel and copper anodes have a potential capacity of 7500 lbs per hour and produce uniform results at high controlled temperatures. Indirect arc heat provides fast controlled melting action and constant motion assures homogeneity of the metals.

The company's new shell mold process for the recasting of nickel produces anodes of the highest purity and density.

American Airlines Salutes The Lea Manufacturing Co.—The Lea Mfg. Co., Waterbury, Conn., one of 9 other companies in Connecticut, received recognition by American Airlines on their Twentieth Anniversary of the Air Travel Plan.

Richmond G. Terry and Curtis A. Tucker representing American Airlines presented an award to Earle W. Couch, president of The Lea Mfg. Co., saluting the company as a 20-year subscriber to the Plan and a member of that distinguished fraternity of Visionary Firms who were first to recognize the benefits of the Air Travel Plan and pioneer its use.

American Brass Co. and Scovill Mfg. Co., both located in Waterbury, Conn., also received the same recognition award.

Diversey's Aluminum Treatment Process Prior to Resistance Welding—"Low, uniform surface resistances for consistently good welds," is the theme of The Diversey Corporation booth No. 61 at the National Welding Show.

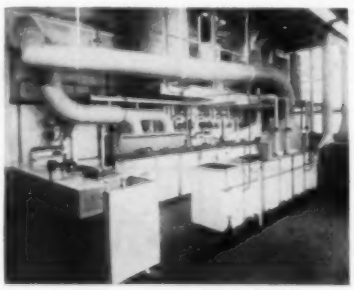
The Diversey exhibit features a small-scale processing line showing cleaning and de-oxidizing chemicals in action.

As the Diversey exhibit graphically proves, the combination of these two products gives the aluminum processor the benefit of low, uniform surface resistances, longer holdover times and welds of consistently high-pull strength.

New Building—The Van Straaten Chemical Company has moved its sales headquarters and main laboratory into new quarters in its own two-story building at 630 W. Washington Blvd., Chicago. The company makes industrial cutting, grinding and metal cleaning compounds.

New Quarters—The General Ultrasonics Co., Hartford, Conn., move to new and enlarged plant at 67 Mulberry Street, Hartford 3, Conn. The new air-conditioned plant provides the additional production, test, research and development facilities required by this company's rapidly expanding business.

Customer Service Lab—Manufacturers who clean, plate or finish metal parts of all types now have available a new Customer Service Laboratory at Mac Dermid, Inc., Waterbury, Conn.



Utilizing the latest in metal finishing techniques and materials, the new laboratory enables Mac Dermid engineers to duplicate under rigid control the processing cycle of virtually any metal finishing plant. By taking advantage of these laboratory facilities at Mac Dermid, manufacturers will be able to analyze and solve metal cleaning, plating and finishing problems before the more costly production stage.

Report on Zirconium Technology and Economics—The Atomic Industrial Forum today announced publication of a new report entitled "Zirconium—Technology and Economics."

The 125-page report is based on the proceedings of a two-day Forum meeting. It includes papers and discussion on chemistry and production of metallic zirconium, fabrication, properties, corrosion behavior, alloys, supply of raw and refined materials, commercial products available, future AEC and industrial requirements. The meeting was held under the sponsorship of the Sub-committee on Process Metallurgy and Fabrication of the Forum's Industrial Committee on Reactor Materials. Publication price is $3.00 per copy.

Distributor—The Michigan Pipe Company, Ferndale, Mich., has been appointed exclusive distributor, in the United States and Canada, for Bart Lectro-Clad, nickel plated pipe and fittings.

Used extensively in the process industries for more than a decade, Bart Lectro-Clad manufacturing will be centralized at a new, specially designed plant in North Newark, New Jersey. Sales headquarters will be: Bart Lectro-Clad Sales Division, Michigan Pipe Company, 2415 Burdette Avenue, Ferndale, Michigan.

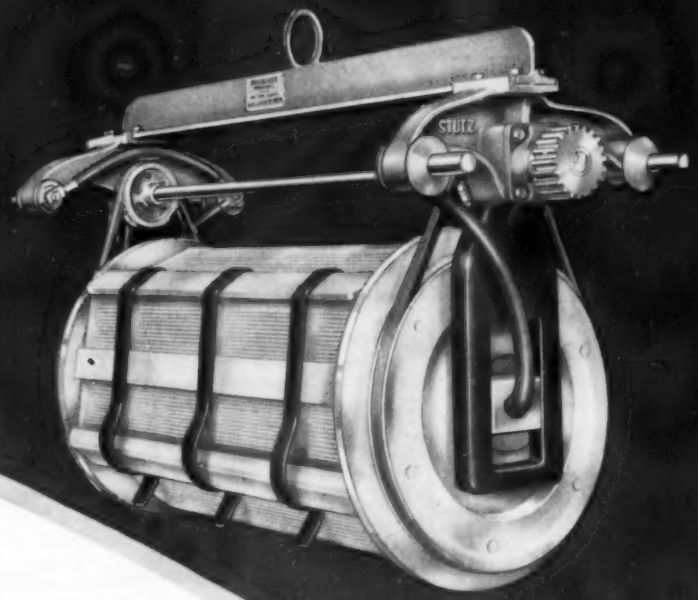
Liaison between the two companies will be maintained by W. A. Hopkins, who was recently appointed general manager of the Lectro-Clad division, Bart Manufacturing Corporation.

T. J. PETERSON

T. J. Peterson, 82, president of Tamms Industries, Inc., Chicago, died Friday, May 4 at his home in Evanston, Ill., after an illness of two years. Peterson established Tamms Industries, Inc., formerly known as Tamms Silica Company, in 1911 and has headed the company in its succeeding 45 years of growth and expansion.

Peterson was a member of St. Luke's Church in Evanston, the Chicago Athletic Association and Exmoor Country Club. He is survived by his wife Marion and a daughter, Helen, of Los Angeles.

DESIGN FOR PRODUCTION



Specially designed counter pulleys of monel metal with deep dimples for positive grip against belt face.

This shows the belt expanding into the dimples of the driving pulleys. This action provides positive pull with no abrasion to the belt whatsoever.

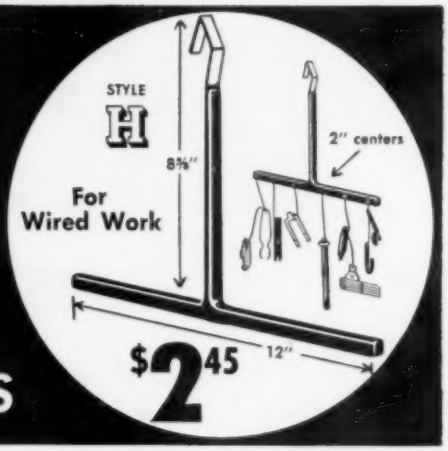
Patent Applied For

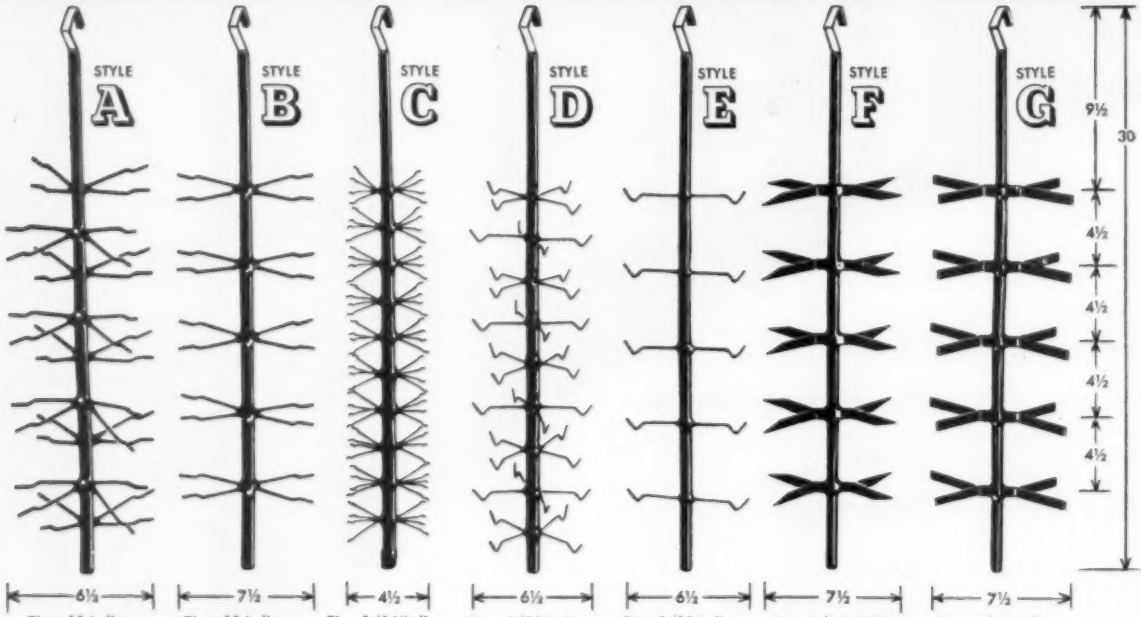
Lower Initial Cost
Lowest Possible Maintenance
No Cylinder Gears
No Cylinder Bearings

Stutz Belt Drive complete cycle Plating Barrel. This unit incorporates a cylinder of one piece Plexiglas construction, suspended and rotated by two V belts and arranged between cast steel guide frames protected with 5/16" thick special vulcanized hard rubber. For smooth barrel operation, saddle horns are located on 15" centers, 4 provided for maximum current. Cylinder door is heavily reinforced and is locked with vinyl chloride covered spring steel bung clamps. Cathode contactors are dangler type. These units made to fit most makes of plating tanks and furnished also with motor drives mounted directly on cylinder superstructure. Standard sizes 14"x30" and 14"x36" (I.D.) 12 additional sizes from 12"x24" to 18"x42" (I.D.). Standard perforations 3/32" round on 3/16" centers. Patented dual hole for processing of extremely small parts available.

GEORGE A. STUTZ MFG. CO., 4450 Carroll Ave., Chicago 24

New, Ready Made Mass-produced *Economy* Plating Racks





Style A	Style B	Style C	Style D	Style E	Style F	Style G
Tips .114 dia. phosphor bronze	Tips .114 dia. phosphor bronze	Tips 1/16" dia. phosphor bronze	Tips 3/32" dia. phosphor bronze	Tips 3/32" dia. phosphor bronze	Tips 1/16x1/2" phosphor bronze	Tips 1/16x1/2" phosphor bronze
$5.78	$4.77	$6.00	$5.83	$4.42	$5.84	$5.69

Add $1.50 packing charge on orders for less than 12 racks.

Made of BEST materials obtainable

SPINES are one-piece solid copper, round cornered and sand-blasted for perfect adhesion of the insulation.

RIGID CONSTRUCTION. The phosphor bronze tips are riveted to the spine, then soldered where necessary for complete rigidity. **Do not confuse with Thinker Boy construction—the tips are not replaceable.**

COATED AFTER ASSEMBLY with the same Universal Plastic used on BELKE Custom-Built and Thinker Boy Racks—withstand all cleaning and plating cycles.

The low prices are made possible through economies of mass production. No specifications can be changed at these prices except in mass production quantities. Prices subject to change with changes in costs.

Place your order early

Economy Racks will be stocked for immediate shipment as soon as production catches up with the demand. In the meantime please order in advance of your requirements and avoid disappointment.

Belke Manufacturing Company
947 N. Cicero Ave., Chicago 51
EVERYTHING FOR PLATING PLANTS

INDUSTRY NEWS BRIEFS

● Officials of the **Pennsylvania Salt Manufacturing Company** have announced intention to immediately replace sodium chlorate cells at the Company's Portland, Oregon plant. Utilizing an improved electrolytic cell developed by Pennsalt technical and operating personnel, the new facilities are expected to go on stream early next year.

● The **Permacel Tape Corporation** is taking part in an exhibit entitled "Patents Promote Progress," sponsored by the U. S. Patent Office and being held in the Department of Commerce building, Washington, D. C. Permacel is participating in the exhibit at the invitation of the Patent Office.

● Designed to aid design engineers and other persons specifying investment cast parts, new material specifications have been released by the **Investment Casting Institute,** Chicago. The date has been the result of several years research and study by the Institute's Metal Specifications Committee to formulate specifications compatible to both user and producer requirements.

● Production in American industry is on a more practical basis than in European industry, according to Albert Buck, General Manager of **Les Emalleries Crahait,** one of the Continent's leading porcelain enamel companies. Buck has been in this country for two months to study on a concentrated basis American production techniques at the plants of the Bettinger Corporation Family of Companies, with which his firm is affiliated.

● **International Division of Beckman Instruments, Inc.,** with headquarters in Fullerton, has assumed responsibility for the exporting activities of all manufacturing divisions of the corporation, according to Edward H. Cherniss, manager of foreign operations.

● **Reynolds Metals Company** has delivered its first commercial order of titanium extrusions. The extrusions were delivered to a jet engine manufacturer.

● Plans for a new aluminum foil plant at Torrance, Cal., have been completed by **Reynolds Metals Company.**

● The **Carborundum Company** will increase its capacity for production of zirconium, a metal used in atomic reactors, to over 1½ million pounds per year with the construction of a new plant in Parkersburg, West Virginia. The multi-million dollar Parkersburg plant will be operated by Carborundum Metals Company, Inc., a Carborundum subsidiary. Announcement of the new plant came immediately after confirmation that AEC had awarded a new contract to Carborundum Metals to supply an additional 500,000 pounds of zirconium annually.

Presently producing 325,000 pounds annually for AEC, the new contract increases the Company's firm AEC commitments to 825,000 pounds of zirconium per year. The new contract also gives AEC priority on an additional 400,000 pounds of Carborundum Metals zirconium production—making the Company's total firm and conditional commitments 1,225,000 pounds of zirconium per year for AEC.

● Governor Luther Hodges cut the ribbon recently, which marked the official opening of **American Machine & Foundry Company's** Raleigh Laboratory, one of the most modern industrial research centers in the South.

Brass Plating Made Easy

●

There is always a standard American tendency to depreciate any claim made by a vendor by a considerable amount. It is so easy to put down on paper half truths.

●

Brass plating is not a simple operation. Conditions must be right. Any chemist confronted with the problem of control would without prior knowledge consider the control of a brass plating solution very difficult. We will agree that it is difficult by ordinary analytical methods. That is the whole purpose back of True Brite Brass Maintenance Solution. With a simple balanced solution of the necessary ingredients that go into a brass solution you can maintain these solutions with good color and efficiency. Only a single addition is normally required with occasional corrections to bring back to original formula. It is not necessary to make daily checks of the solution. Additions can be made by ordinary unskilled personnel.

●

We wish we could promise complete control without any supervision but the skill of the plater is still useful in determining when corrections are necessary. To assist we have a bulletin on brass plating and some new sheets on analysis and solution formula that are very useful. These are available on request.

●

Yellow brass is the simplest to control. The yellow color does not change too rapidly with change in composition. Red or bronzy brass solutions are more difficult. To control properly the copper content of the plate must be maintained within about 1%. True Brite has special Brass Maintenance Solutions designed to help you with the problem of maintaining these solutions. We can recommend formulas and have available concentrated solutions which will enable you to make up new solutions simply and with a minimum of trouble.

●

As prime manufacturers of copper and other cyanides the price of the materials is competitive. We have statements from users advising us of their costs which compare with the use of basic chemicals. Most of all comparisons with so-called proprietary solutions show that brass plating solutions operated according to our suggestions are as fast and as bright with less difficulty with color both in barrels and still tanks. Your inquiry is invited.

TRUE BRITE CHEMICAL PRODUCTS CO.
P. O. Box L31 OAKVILLE, CONN.

BRIGHT FINISH CADMIUM AND ZINC PLATING AT LOW COST!

Cadmax and Zimax, Federated's new addition agents for cadmium and zinc plating baths, eliminate dull, frosty finishes . . . and do it at low cost!

Cadmax for cyanide cadmium plating produces clear, brilliant, blue-white deposits, prevents burning, minimizes staining, does not foam, and is easy to control. An adjuster solution, furnished free with Cadmax, eliminates breaking in the bath, gives perfect plating from the first load.

Zimax for zinc plating produces clear, bright deposits, increases covering and throwing power, and is much more economical to use than similar materials. It is available in powder or liquid form; for barrel or still brightening. It usually may be added without conversion treatment to any zinc solution using a proprietary addition agent.

Experienced laboratory and field personnel are available to give complete technical service, including solution analysis and recommendations. Call or write to Federated's Plating and Electrochemicals Department; or get in touch with your nearest Federated dealer.

Federated, first in the non-ferrous field. FMD

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DIVISION OF AMERICAN SMELTING AND REFINING COMPANY
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Aluminum, Anodes, Babbitts, Brass, Bronze, Die Casting Metals, Lead, Lead Products, Magnesium, Solders, Type Metals, Zinc Dust

INDUSTRY NEWS

Trinks Award Goes to Four Pioneers in Industrial Heating—Two executives and two engineers who have made important contributions to the science of industrial heating, were recipients on May 28 of the Trinks Industrial Heating Award, highest honor in the industry.

The four honored were John W. Harsch, director of engineering of Leeds & Northrup Company, Philadelphia; William C. Dunn, chairman of the board, Ohio Crankshaft Company, Cleveland; Osgood J. Whittemore Jr., research ceramic engineer, Norton Company, Worcester, Mass.; and Ernest G. de Coriolis, for 30 years the director of research and development, Surface Combustion Corporation, Toledo, Ohio.

The Award, bestowed annually by a judges' panel of industrial heating authorities, is named after Willibald Trinks, professor emeritus of Carnegie Institute of Technology, a member of the panel, first recipient of the Award and world authority on industrial heating problems.

Other judges are Dr. John C. Warner, president of Carnegie Tech; T. J. Ess, managing director of the Association of Iron and Steel Engineers and editor of *The Iron and Steel Engineer;* Carl L. Ipsen, executive vice-president of Industrial Heating Equipment Association, and Glen C. Riegel, Aiken, S. C., retired chief metallurgist of Caterpillar Tractor Company.

On presenting the awards, I. Stanley Wishoski, editor of *Industrial Heating* magazine, cited the achievements of the awardees which led to their selection by the Committee.

E. de Coriolis and J. Harsch are both eminent in the field of gas research and furnace development.

E. de Coriolis holds 17 patents in the field of industrial heating. His researches have led to the successful solution of many gas chemistry and heat transfer problems in industrial furnace design and application. His work has contributed to development of atmosphere gas generators, dew point indicators and controllers, and given rise to the extremely high speed convection type furnaces.

J. Harsch holds 13 patents including that for the Homo Method of forced-convection heating and for his work in gas potentials. His achievements have contributed to industry's ability to produce parts of high uniformity, low cost and of whatever quality is desired. His work has led to modern practices in carburizing, dry cyaniding, nitriding, steam treatment and the use of inert gases.

O. Whittemore, only 37 years of age, has already received much recognition in his field, having won the Admiral Ralph Earle Award in 1949 for his research and development of magnesia and zirconia re-

fractories. He was a pioneer in developing stabilized zirconia refractories, which will withstand temperatures up to 4,700° F, making possible the manufacture of higher temperature furnaces.

W. Dunn, founder of his company, and director in several others, invented the "Tocco" electrical induction heat treatment process, pioneering in quick case hardening of steel bearings. His work has increased the life of truck crankshafts from about 40,000 to 500,000 miles. He helped introduce quick case hardening of metal parts in other industries. He has been a leader in fostering the growth of the induction heating industry in general.

British Manufacturer Appoints American Agent—Air Products, Incorporated, Allentown, Pa., has recently been appointed sole agent in the United States for the products of International Electrolytic Plant Company, Ltd., of Sandycroft, Chester, England. Air Products, leading manufacturer of air separation and low-temperature processing plants, will market and service the British concern's electrolytic cells and related equipment as a supplement to its own line.

New Corporation—R. B. Goodsell, vice-president of Racine Plating Company, one of the leading plating companies in Racine, has formed a new corporation to engage in high vacuum metalizing. The corporation is known as Vacuum-It, Inc., and is located at 622 Stannard Street in Racine. Vacuum-It will plate ferrous, nonferrous, and plastic parts either with first or second surface coatings as required.

Garrett—New Norton Distributor—The Garrett Supply Company, a division of The Garrett Corporation, has announced that it will handle Norton Grinding Wheels, as an addition to its lines of famous brands of industrial supplies.

The Norton Company started in business in 1882 as a manufacturer of bonded abrasives.

In addition to complete stocks, Garrett Supply also maintains a staff of factory-trained, abrasive specialists who are available for outside consultations on any grinding problems.

Solvay Expands Soda Plant

Plans for expansion of its mercury cell chlorine-caustic soda plant, now under construction at Brunswick, Ga., were announced by Solvay Process Division, Allied Chemical & Dye Corporation.

Capacity of the plant will be doubled and construction of the initial facilities is expected to be completed late this year. It is hoped to have the second step ready for operation in the fall of 1957.

WAGNER BROTHERS

NEW GERMANIUM POWER RECTIFIER

. . . has 95% efficiency
. . . with 100% protection!

Germanium has no peer for use as a semiconductor in providing an efficient source of DC current. However, germanium is extremely heat sensitive and must be protected against thermal overload and current faults which, if unchecked, would instantly destroy the germanium junctions.

After two years of research and design in collaboration with the General Electric Company, Wagner Brothers is proud to announce their new, *completely protected*, highly efficient Germanium Power Rectifier.

General Electric "Safety Cells" are hermetically sealed to shield the germanium element from moisture and any corrosive fumes. Each "Safety Cell" is individually protected from destructive current faults by fast-acting "amp trap" fuses which break the circuit in a fraction of a second, before the germanium junctions can be destroyed.

Further protection from normal overcurrent and undervoltage input is provided by separate breakers on the main contactor and on the blower motor. A pressure switch guards against thermal overloads in case of blower malfunction.

Now you can have the advantages of efficient germanium power rectification—plus, assurance that current faults and overheating will not cause stack burnout, downtime and expensive repairs.

If you need a dependable source of DC current, write for our portfolio of technical information.

CHICAGO
CINCINNATI
CLEVELAND
INDIANAPOLIS
NEW YORK
ROCHESTER

Wagner BROTHERS INCORPORATED

425 MIDLAND AVE., DETROIT 3, MICHIGAN

PERSONALS

Krentel

Lupien

G. Stuart Krentel has been appointed manager of Technical Sales Service for the western region of Kelite Products, Inc., manufacturers of industrial cleaners and cleaning equipment.

Announced also were the appointments of: **Albert W. Lupien,** former sales manager of the Midwestern area has been promoted to regional vice-president; **Gurdon T. Henry** has been appointed district sales manager in the Ohio area; **W. John Boyd**, formerly sales supervisor of the Chicago area has been promoted to Metropolitan Chicago district sales manager.

Henry

Boyd

Richards

Hamner

Owen Richards has been appointed manager of Metal & Thermit's new mine and titanium ore dressing plant now under development at Beaver Dam, Va.

D. H. Hamner has been appointed to the staff of the Automotive Division, Technical Service Department of Parker Rust Proof Co. Hamner comes to Parker with over twenty years' experience with the General Motors Corporation in the field of production metal finishing and painting.

Kubis

Cornwell

W. P. Cornwell recently became sales manager of Wyandotte Chemicals Dallas District. Cornwell is a graduate of Ohio State University, joined Wyandotte in 1945 and was a sales representative in Pennsylvania, Ohio and Colorado.

Also announced was the appointment of **Edward J. Kubis** as manager of industrial sales of Wyandotte Chemicals Industrial, Railroad and Aircraft Department. Following 3 years with Wyandotte Chemicals Industrial Research Laboratories, Kubis became the senior technical service representative for the department which he now joins as manager industrial sales.

Stanford J. Barlett has been appointed manager, Washer Division of Circo Equipment Co. Barlett's responsibilities with the firm will include complete supervision in sales, design and manufacturing metal parts washers and dryers or complete finishing systems.

Dr. Robert K. Smith has been appointed manager of research for E. F. Houghton & Co. His special fields of interest have been concerned with the development of fortified lubricants for industrial equipment, specialty chemicals and studies of petroleum processes.

Meindl

Watson

J. A. Meindl has been appointed sales representative for the Permutit Company of Canada, Ltd. in Toronto, Ontario. Meindl has served as the Montreal sales representative for the Permutit Company of Canada, Ltd. for the past ten years.

J. M. Watson has been appointed to succeed Meindl as sales representative for the Montreal Office of the Permutit Company of Canada, Ltd.

H. D. McLeese has been elected a vice-president of Metal & Thermit Corp.

McLeese

McLeese, who was named general sales manager of Metal & Thermit in May 1955, will continue as the company's chief sales executive. As vice-president, he will direct sales, market development and research and advertising of all Metal & Thermit and United Chromium products. He is also a vice-president of Metal & Thermit—United Chromium of Canada, Ltd.

Herman Behme has been appointed to the position of eastern manager of the Market Development Department of Stauffer Chemical Co.

Jack Gabrielson will represent Allied Research Products, Inc. in the northern Chicago territory. Gabrielson will serve the area consisting of the north side of Chicago and the northern Illinois counties including Rockford.

Frank Bryant, formerly covering the Iowa, Nebraska and West Illinois territory, has also moved to the Chicago area. Bryant will cover the south side of Chicago as well as southern Illinois and Indiana.

Arthur Jackson of Davenport, Iowa has been appointed to take over the Iowa-Nebraska-Western Illinois territory, formerly handled by Bryant.

Harry P. Barrand has been elected to the board of directors of Hanson-Van Winkle-Munning Co.

Barrand is president and director of the Climax Fire Brick Co., Climax, Pa. He also has his own business at 57 William St. in New York City, where he acts as a financial agent and consultant on problems of financial reorganization.

Barrand

Waalkes

Also announced was the appointment of **Paul A. Waalkes** as assistant manager of compound sales.

In this capacity he will direct H-VW-M's program for formulating and developing metal finishing compounds at the company's J. C. Miller Division, Grand Rapids, Mich.

CUSTOMER IN COLUMBUS needs a special proprietary chemical *immediately*. Manufacturer of the chemical has none on hand — nearest stock point is 350 miles away. Situation desperate, can Merchants do something?

MERCHANTS' MAN IN CINCINNATI calls the manufacturer, locates several drums of the chemical at the plant of a nearby soap company. They agree to lend three drums to meet the emergency. Merchants' truck makes the pickup.

AT MERCHANTS' WAREHOUSE, the drums are loaded into the car of "Dutch" Spatta, manager of Merchants' Cincinnati office. Regular delivery by truck will take too long.

A FAST 108 MILES LATER "Dutch" delivers the drums in time to keep production going. It was somebody else's product and somebody else's problem, but Merchants again lived up to its reputation for helping a customer out of a jam.

WHY MERCHANTS' CINCINNATI MANAGER DROVE 108 MILES TO DELIVER SOMEBODY ELSE'S PRODUCT —

At Merchants, service goes beyond the mere filling of orders for industrial chemicals. Each office of Merchants' nationwide chain makes a point of becoming familiar with its customers' problems. In the past 35 years Merchants has frequently "walked the extra mile" to help a production man out of a tight spot. Among the products offered are acids, alkalis, fungicides, surfactants, chlorinated solvents, emulsifiers, laundry compounds, soaps, dry ice and chemical specialties.

MERCHANTS CHEMICAL COMPANY, INC.

60 East 42nd Street, New York 17, N. Y.

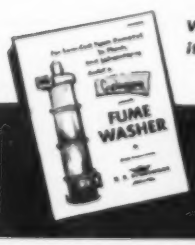
SALES OFFICES AND WAREHOUSES: Chicago • Cincinnati • Denver • Louisville • Milwaukee • Columbus • Minneapolis • New York • Omaha

STOCK POINTS: Albuquerque, N. M. • Erwin, Tenn. • S. Norwalk, Conn.

The Cyclonaire is a "package" Fume Washer, complete with Intalox Saddle Tower Packing and motor. Unlike old fashioned "custom built" units, its compact design permits more advantageous location inside the plant — duct runs are shorter, power requirements are lower. It is available in four standard capacities: 750, 1,650, 3,500 and 6,000 c.f.m., which enables the user to "tailor" a fume removal system to his particular plant. For example: one plant may best be served by a single 6,000 c.f.m. unit, while another plant solves its problems by strategically placing two or more smaller units.

The Cyclonaire is easily adapted to special applications, too. In the majority of cases standard components are used, with no involved engineering or special parts fabricating required. Consider for a minute what this flexibility can mean in time and money saved . . .

The Cyclonaire removes up to 99.9% of many gases in concentrations of 1% or less, and safely handles corrosives in low concentrations. Each unit is fully Tygon-protected inside and out against corrosive fumes normally encountered in metal working operations. Constructed of steel in flanged sections, it can be assembled by two men in half a day—or as quickly disassembled and relocated. But you'll want the whole story, so . . .



Write today for Bulletin FW-5
it is yours without obligation

PROCESS EQUIPMENT DIVISION 254-E

U. S. STONEWARE
AKRON 9, OHIO

PERSONALS

Donald J. Tricebock has been appointed head of the newly-formed Instrument Division of Fischer & Porter Co. Tricebock holds degrees in electrical engineering from Drexel Institute of Technology and the University of Pennsylvania. He joined Fischer & Porter in 1952 as electronics research engineer. Previously, he had been an electronic design engineer for six years at RCA Victor.

He is a member of Tau Beta Pi, Phi Kappa Phi, and Eta Kappa Nu honorary fraternities; the Philadelphia Section of the Instrument Society of America; The York Road Industrial Management Club; and is a licensed Pennsylvania professional engineer.

Philip E. Sellers, formerly sales manager, becomes sales vice-president; **Herman Kockritz,** formerly southeastern divisional manager becomes field sales manager; and **William Trethaway,** formerly sales engineer, becomes district manager of the Atlanta office according to an announcement from Fischer & Porter.

IMPORTANT NOTICE TO MEMBERS AND SUBSCRIBERS

If you are going to move, it is necessary that the proper notification be made at the earliest possible moment, so that you may continue to receive your copies of PLATING without interruption.

Members must notify Branch Secretaries of changes promptly.

Notification should be made to this headquarters by letter, post card, or post-office form No. 22S, give the old address as well as the new, with postal-zone number if any. You should also notify your local post office on postal form No. 22 of your change of address. Both postal forms are obtainable at any post office.

You are urged to advise the PLATING Circulation Department and, in the case of Branch members, your secretary, as soon as you know your new address, preferably three weeks in advance of moving.

PLATING
Circulation Department
445 Broad Street
Newark 2, N. J.

*"Symbols MUTUAL

YOU CAN RELY ON"

The karat number is the hallmark of quality on any article made of gold. In addition to signifying the guaranteed gold content, it is also a symbol of the reliability of the manufacturer.

The Mutual trademark on shipments of Chromium Chemicals is likewise a mark of quality and reliability. Mutual has always taken pride in its reputation for producing chemicals which meet rigid specifications and for supplying the needs of its customers.

Chromic Acid • Sodium Bichromate • Potassium Bichromate

MUTUAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION

99 PARK AVENUE • NEW YORK 16, N. Y.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 716.

L—700. Electric Heating Cable—An electric heating cable, manufactured by Edwin L. Wiegand Co., under the tradename, Chromalox Silicone Thermwire, utilizes the amazing heat resistant characteristics of silicone rubber to permit continued temperatures of 275° F. This new development provides a convenient and accurate method of applying or maintaining heat in pipes, vats or irregular objects where consistent high temperatures are required for controlling viscosity, chemical action and volatility in fluids.

Silicone Thermwire is a high quality nichrome resistor heating wire covered with a heavy sheath of flexible heat-resisting silicone. It provides a high dielectric strength, excellent resistance to moisture with good corrosion and abrasion qualities. Wattage output and heating ability are determined by the length of wire used and the spacing between coils when wrapped around vats or pipes. Automatic temperature control is obtained by the use of a thermostat or percentage input controller.

It is easy to install, gives exact heat output desired, low in operating costs and the same style Thermwire in appropriate lengths can be used on 110 or 220 volt ac or dc supply. Available in minimum length of 60 ft or the handy utility reel of 400 ft.

L—701. Converting Acid Electric Furnaces to Basic—Basic Inc., a leading producer of granular basic refractories, announces the availability of its new 12-page illustrated booklet entitled "Let's Make Basic Steel."

Many acid furnace operators, aware of the numerous advantages of basic operation, are exploring conversion possibilities. This booklet, in addition to discussing the comparative merits of both processes, outlines advantages of basic operation, estimates probable conversion costs and explains certain operating difficulties and their corrective measures.

L—702. Ethyl Silicate—An 18-page technical booklet on the use of ethyl silicate for precision casting is offered by R. W. Greeff & Co., Inc., New York, exclusive sales agent for the manufacturer, Montrose Chemical Co., Inc.

The brochure describes the hydrolysis, gelation, setting and hardening of ethyl silicate, precoat and investment preparation, typical formulae, solutions of typical investment casting problems, and analysis, specifications and prices for Montrose ethyl silicate.

L—703. Moisture-Proofing Additive—Losorb, a new additive for moisture-proofing concrete and cement materials, is described in a new Picco bulletin page, published by the Pennsylvania Industrial Chemical Corp. The bulletin page, which is free, gives the characteristics and applications and tells of the advantages of using Losorb in concrete blocks, mortar and plaster, stucco, concrete farm silos, and concrete in industry.

L—704. Model Rotator—A new catalog sheet describing the Morse Model 200 Variable Speed Portable Drum Rotator is offered by Morse Manufacturing Co., Inc.

Specification bulletin No. 155 describes in detail all pertinent facts and the many exclusive features of the Morse portable rotator, including its special tipping lever that makes this rotator adaptable for use with fibre containers. Safely and easily handled by one man, this drum rotator is easily manipulated in tight quarters and can be moved from job to job with no trouble.

L—705. Electric Heating of Plating Solutions—A 4-page bulletin offered by the Edwin L. Wiegand Co., illustrates and describes a wide range of electric heaters designed for the heating of cleaning, pickling and plating solutions. Types for mounting through tank walls, side arm mounting, various shapes of side hung immersion heaters and special applications of outside-wall clamp-on flat heaters are illustrated. Kilowatt ranges from 0.6 to 100 with a wide selection of corrosion-resisting sheath materials and automatic thermostatic controls are shown. Special features are overall acid-resistance, completely sealed, extra heavy moisture and shock-proof construction for rugged service requirements. Temperatures are accurately and automatically controlled with individual tank heaters and controls, permitting exact solution temperatures required for the wide working range of different plating operations. Also illustrates high speed, far-infrared heaters for mechanized parts drying and radiant heaters for winter comfort heating.

L—706. Pyrometers and Resistance Thermometers—The General Electric Co's Type HP—GEC—1324A, 2 pages, describes features, accessories, application, specifications and special calibration of instruments for temperature indication and control of industrial processes.

L—707. Tri-Clad 55* Explosion Proof Motors—Bulletin GEA-6341, eight pages, discusses design features and maintenance of new induction motors, one through 30 horsepower, for use in hazardous locations is offered by General Electric Company.

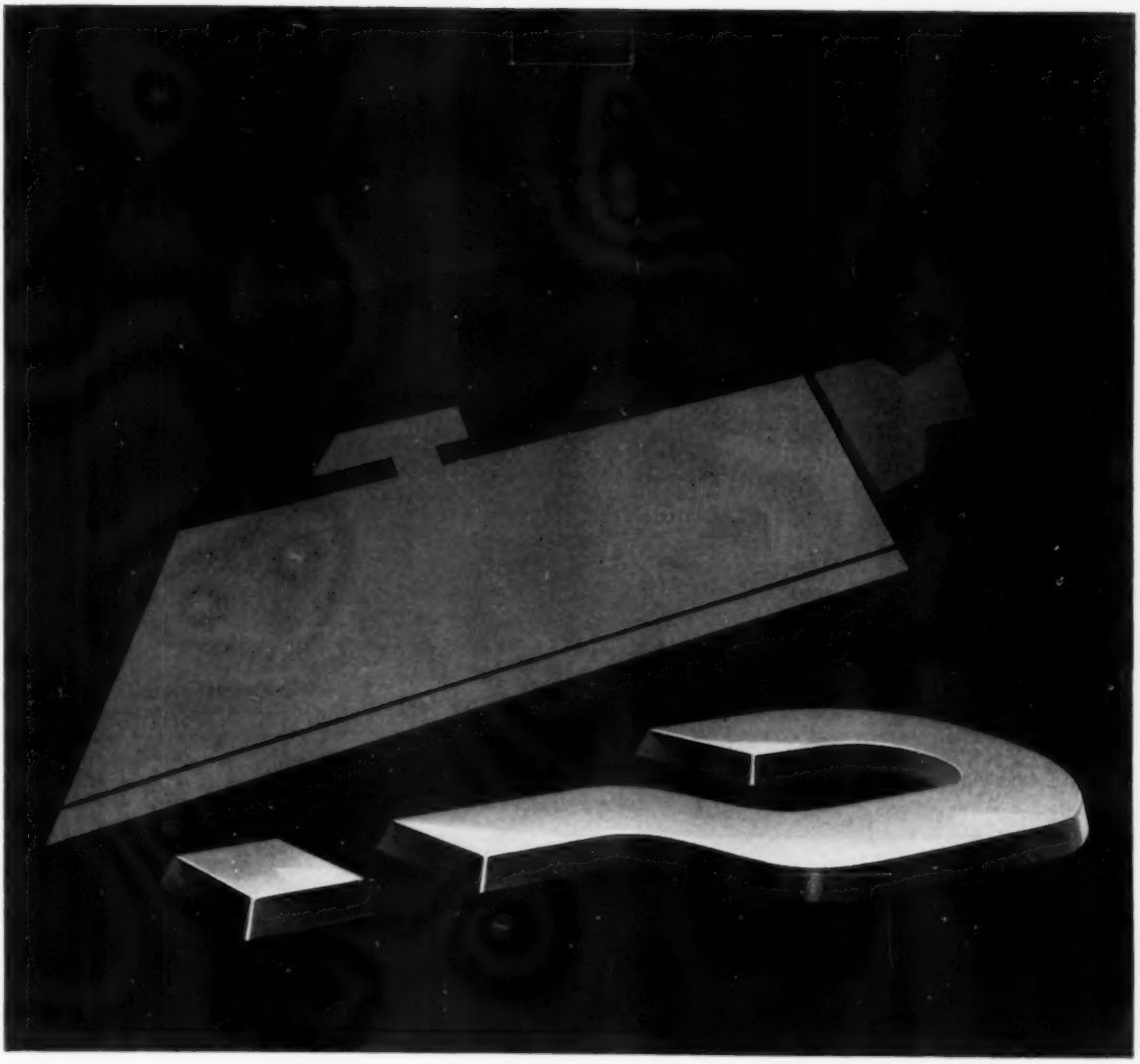
* Registered trade mark of GE

L—708. Electronic Temperature Controller—Specification Sheet S1010-1 describes the Honeywell Model 077 electronic temperature controller. This is a non-indicating device, which operates on the balanced bridge principle. It can be supplied as a single point controller, using a single bulb, as a differential controller, for control on the temperature difference between two bulbs, or for cascade control, using two bulbs.

L—709. Anodes—Latest data on oxygen-free high-conductivity (OFHC) copper anodes are now available in two free brochures issued by The American Metal Co., Ltd. These booklets are the most recently published of a continuing series which covers the applications of OFHC copper anodes in electroplating. AMCO Publication CA-11 is a report by an independent industrial research laboratory on the results obtained with OFHC anodes in various acid and cyanide plating baths. The report covers experiments in which the new OFHC anodes were matched against other types of copper anodes under different operating conditions. Detailed descriptions of the operating conditions and of the results obtained are presented, along with extensive tables and graphs. The laboratory reports significant lessening of nodular deposits and of other objectionable phenomena through the use of OFHC anodes.

AMCO Publication CA-10, "Improving Your Electroplating Operation," highlights the data given in the laboratory report and describes the resultant electroplating advantages in a less technical, fast-reading style.

L—710. Plastic Pipe and Fittings—Two types of unplasticized polyvinyl chloride pipe and fittings are described in a new product bulletin issued by the Alloy Tube Division of The Carpenter Steel Co. One type is a normal impact grade and the other a high impact grade. The bulletin gives a general description of both types, along with their specific advantages. Applications are listed by industry and process. The full range of corrosion resistance is also defined. Tables give such technical data as physical properties, dimensions and weight, maximum working pressures, types and weights, burst pressures, and thermal expansion and contraction. Installation instructions are given on cutting, threading, threading compounds, assembly of threaded joints, solvent cementing, bending, hanging and thermal compensation.



Iron out your chrome-plating problems with Diamond

Let DIAMOND's technical specialists go to work on your chrome-plating problems. These men work full time on customers' questions. They come up with complete, profit-making answers. Their service is free.

In producing chromic acid, DIAMOND controls *every* processing step to safeguard quality. DIAMOND experience starts with importing the chrome ore and making the soda ash, and extends through production and delivery. It even includes standing by your side, if you wish, to help you get top-quality plating results and keep costs low.

DIAMOND facilities—two chromic acid plants and nine warehouses and sales offices across the country—assure you uninterrupted supply and dependable service. DIAMOND ALKALI COMPANY, 300 Union Commerce Building, Cleveland 14, Ohio.

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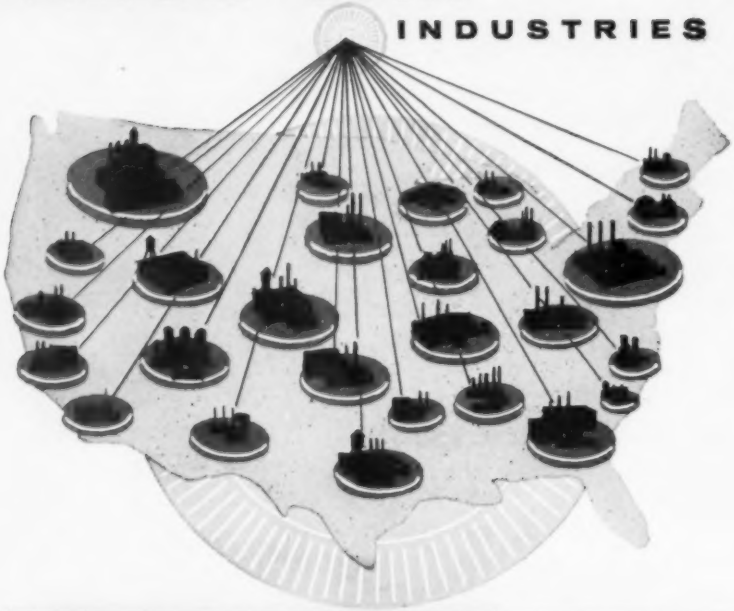
Diamond Chromic Acid

Choice of the Nations

BLUE CHIP

INDUSTRIES



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Meaker equipment is used for efficient and economical plating by many of the nation's most important builders of such products as automobiles, appliances, machinery, furniture and many others. When they install Meaker engineered equipment they are assured that it is designed to meet specific requirements. They are also certain that Meaker will stand behind the equipment during its whole operational life, making sure that it produces the best possible plating job at reasonable unit costs.

Meaker has accomplished much for other manufacturers. Why not find out what we can accomplish for you? Our engineers will be happy to survey your problems with you and recommend the equipment you need. Call or write today!

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• Full Automatic and Semi-Automatic Plating Machines • Strip Steel Plating Equipment • Wire Galvanizing Equipment • Batch Type Plating Machines • Pickling Machines • Motor Generators for Plating • Processing Conveyors • Rectifiers for Plating

TRADE ~ LITERATURE

L—711. Chemicals—The S. W. Shattuck Chemical Co., has published an eight-page brochure describing the various molybdenum, uranium, vanadium and tungsten chemicals they offer.

L—712. Germanium and Selenium Rectifier Guide—A new revised edition of their popular guide to power conversion rectifiers, has been published by Bart-Messing Corporation, manufacturers of Sel-Rex rectifiers.

The new 12-page "guide" is profusely illustrated with photographs of different sizes and styles of rectifiers for every d-c power need, annotated with detailed information to aid in the selection of rectification equipment for specific applications.

Featuring the new Sel-Rex germanium rectifiers, the guide also illustrates a self-contained selenium unit which is typical of the recently introduced Sel-Rex economy line of quality rectifiers.

L—713. Deaerating Heater—Technical Reprint T-149, which discusses the new SSC Deaerating Heater, is now available from Graver Water Conditioning Co.

This paper discusses some of the reasons why this shop-built unit was developed and the details of construction.

The article, which has many photographs of the heater, also includes detailed information on sizes, dimensions and space requirements. This data will allow the plant engineer to determine which SSC Heater is best suited to his individual problems.

The Graver SSC Deaerating Heater is a completely shop-built, stocked unit for the smaller plant that will perform all of the functions of custom made, larger heaters at economical costs. It requires an absolute minimum of headroom and operational care.

L—714. Demineralization—Graver Water Conditioning Co., now has available, without obligation, Technical Reprint T-140. A 24-page, profusely illustrated article on all the phases of demineralizing, it discusses in detail the advantages and disadvantages of this process for today's power plants.

The paper considers some of the developments, trends and applications of both multi-bed and mixed-bed ion exchange and uses several case histories as examples. A complete comparison of the two types of demineralizing systems is presented as well as some of the important factors that go into the chemical and mechanical design and operation of these units.

Design, consulting and operating engineers will find the article a worthwhile addition to their library if for no other

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 718.

UNICHROME
Trade Mark

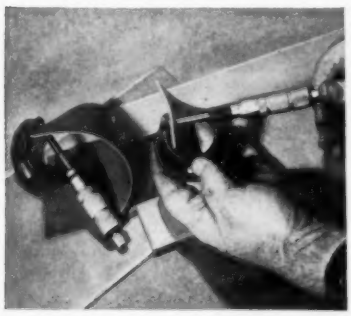
News about
COATINGS for METALS
Metallic . . . . . Organic . . . . . Decorative . . . . . Protective

NEW CHROMATE DIPS CUT COSTS

Protective coating 60 mils thick or more with one spraying

Another improvement in plastisol coatings has again been achieved. Unichrome "Super 5300" Coating delivers the full solids content of vinyl plastisol through a spray gun and builds up a coat 60 mils thick or more in one application. Less of course, if desired.

The coating is physically tough and flexible. It doesn't chip or tear. It has



the chemical resistance as well as the thickness to withstand contact indefinitely with plating solutions, cleaners, water and other corrosives.

Send for Bulletin SVP-1 which gives more data.

**Unichrome is a trademark of Metal & Thermit Corp.*

METAL & THERMIT
CORPORATION
General Offices: Rahway, New Jersey
Pittsburgh • Atlanta • Detroit
East Chicago • Los Angeles
Metal & Thermit–United Chromium of Canada, Limited, Toronto

Unichrome Dips developed that provide chromate solutions with lower make up and operating costs

An unusually wide line of Unichrome Dips for zinc plate, die castings, and cadmium has been made even more inclusive by three new additions to the line. Two of the new compounds are the dry, or powder, form for extra economy in shipping and handling. The third is a wet compound which facilitates solution mixing. All, however, work at extreme dilutions.

NEW ECONOMY

At low make-up concentrations, cost of these three Unichrome Dips descends to a new low. Unichrome Dips are also known for the long service they give before being discarded. End result is the low cost per sq. ft. of finish reported by so many users of Unichrome Dips.

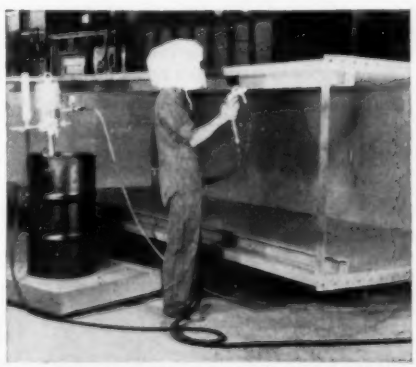
MATCHED TO THE NEED

Unichrome Dip Solutions, forming corrosion-resistant finishes integral with the zinc, improve and protect its eye appeal. Since chromate dips are active solutions which *strip* the zinc as well as convert its surface into an attractive but inactive film, the type of equipment used and the operating time or cycle affect results. The differing needs of manual or automatic finishing must be satisfied to produce the color, the corrosion resistance, the uniformity of finish —as well as the economy desired. No single chromate solution is equally suitable for all applications. This explains why so many specialized Unichrome Dip Compounds are available.

Metal & Thermit will gladly recommend the proper dip to meet specific needs. Simply submit details of the product and the requirements.

Plastisols ideal for protecting tanks

Because of its thickness, chemical inertness and sprayability, the new Unichrome "Super 5300" Plastisol Coating makes a superior tank lining. It can withstand continuous contact with severely corrosive solutions, save over the cost of applying sheet-type linings, and has no seams for corrosive solutions to penetrate. Moreover, there now exist a number of strategically located companies skilled in applying Unichrome Plastisols, and which have the baking facilities to handle even large tanks. Send for names.



Large plating tanks being sprayed with Unichrome Plastisol prior to being wheeled into baking oven for curing.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 719.

To offer you a more complete line than ever before

the Chemical Corporation
announces

New
LUSTER-ON® "50" POWDER

After months of painstaking research and development, The Chemical Corporation adds to its well-rounded line of dips and coatings

LUSTER-ON 50 POWDER

For those interested in buying a powder rather than a liquid there are the following advantages with Luster-On 50 Powder.

- Can be used on zinc or cadmium.
- Powder quickly and easily soluble in water.
- Packed in polyethylene-lined fiber cartons; *eliminates expensive handling, space-consuming storage and bothersome $15.00 deposits on carboys.*
- Applied at room temperature.
- Will not crystallize out.
- Gives off *no* obnoxious odors or gases.
- Bright, clear, long-life coatings, equal results obtained with ready-mixed liquids.
- Possible to obtain iridescent color by changing concentration when corrosion is a prime factor.

Consider these advantages when ordering

Data Sheets Available

Still available, of course — time-tested Luster-On liquid dips and coatings for all your needs.

SEND IN PART FOR FREE PROCESSING

THE *Chemical* CORPORATION

57 Waltham Street, Springfield 9, Mass.

TRADE-LITERATURE

reason than for the bibliography. Undoubtedly the most complete source of information on demineralizing and ion exchange available to date, this list contains 119 separate items.

In addition to this high informative data, the paper, which was originally presented at the Diamond Jubilee Annual Meeting of the ASME, has several valuable tables on such items as characteristics of anion exchangers, materials of construction, glossary of terms and specific conductivity of effluent. Flow sheets, descriptive drawings, performance curves, process selection charts and cutaway views are also included as part of this highly informative, impartial paper.

L—715. Maintenance Painting—The DeVilbiss Company's new spray painting products, designed for the maintenance and contract painter, are included in the new edition of the maintenance painting catalog which is ready for distribution.

In the catalog, DeVilbiss has included its new P-CGA spray gun which is used effectively with a 1/2 or 1/3 hp air compressor. Other new products in the book are a P-QBF paint pump and the portable paint heater.

To guide the painter, the booklet contains an easy-to-read chart which specifies the correct spray gun to be used with the various classes of materials. Since all materials do not spray alike, DeVilbiss manufactures a wide variety of models for application of the various classes of materials. The catalog also will guide the painter in selection of equipment for specific jobs.

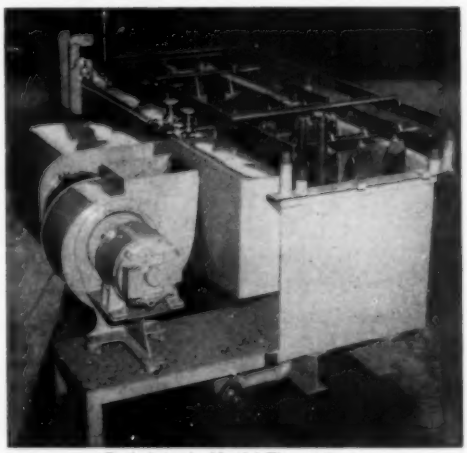
In addition to showing the wide range of equipment for spray painting in the maintenance and contract painting fields, descriptions of each article, plus cross references make this a valuable guide book for the painter.

L—716. Ebert 20-Ampere Minirelay—Complete description, technical data, and illustrations on the recently announced Ebert midget minirelay Mercury Plunger Relay are now available in a new bulletin from the manufacturer. The bulletin fully covers operational and construction details, load ratings and typical features of this latest addition to the nationally known Ebert line.

The minirelay is rated and proved in use for all loads up to 20 amps at 115 volts, ac, and may be had either normally open or normally closed. Actuating coils are available in most standard operating voltages. Features include: Reliable, silent, service-free, hermetically sealed mercury contacts for use even under adverse atmospheric conditions; small size in line with today's miniaturization trend; economy, long-life and ease of installation; and low cost.

For tank cycles that excel in service life see STORTS

BUYERS of Stortswelded plating tanks have proved by performance records that it pays to invest in Storts single-standard welding—one quality for all customers.

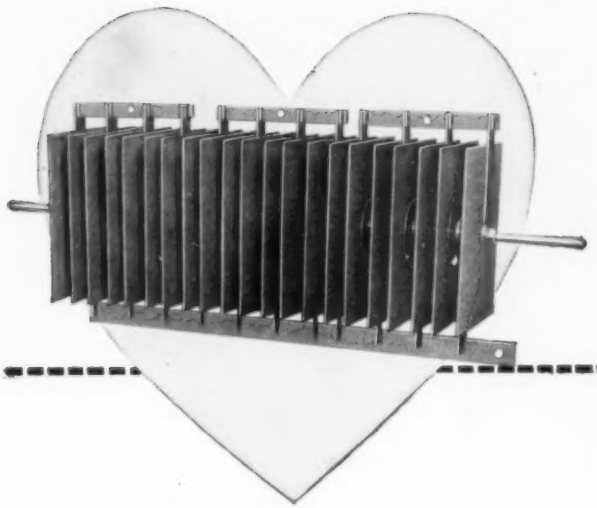


Tank design by Metal & Thermit Corp.

Storts experience in the fabrication of single tanks and complete cycles for many hundreds of severe service requirements will help you to design for top performance and long range economy.

42 STONE STREET — STORTS WELDING COMPANY INCORPORATED — MERIDEN, CONN.

Manufacturers of Welded Fabrications to Specification



Six Square Inches per Ampere* of "Heart"--!

The selenium stack is the heart of any selenium rectifier. For it is the quality of the stack and its accompanying circuitry that determines the effectiveness of a rectifier, just as the state of the heart and blood vessels of a human determine his strength and health.

IT'S A PROVEN FACT, RAPID RECTIFIER STACKS STAND UP LONGER IN HARD SERVICE. HERE'S WHY:

1) Rapid allows 6 square inches per ampere of plate surface in full wave bridge circuits. For years we have maintained this standard (somewhat higher than other makes), since we feel allowing this much area results in maximum life expectancy.

2) The plates in Rapid stacks use triple purified Selenium.

3) They are carefully tested and balanced for even current distribution.

4) They are coated with an exclusive material rendering them absolutely impervious to the corrosive conditions existing in plating rooms.

5) The plates are spaced an average of ½ inch, diminishing the possibility of dust, dirt and corrosive material becoming lodged between plates, thus allowing heat to dissipate readily.

Rapid designs its stacks to much higher standards than most other manufacturers.**

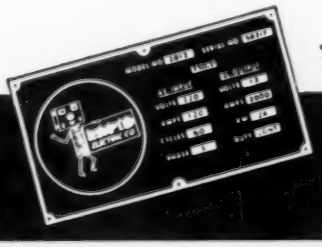
For example:

In tests performed at ambient temperatures of over 30°C, a recognized electrical manufacturers' group standard allows a temperature rise in the stack of 60°C; and, a rise of 40°C at the same ambient temperature for 1000 hours is permitted without derating.

Rapid standards permit a maximum stack temperature rise of only 22°C above the ambient. This low rise is made possible only because of the large area used per ampere, the plate spacing, high purity of Selenium used, the advanced circuitry and the engineering skill which designs the complete rectifier unit for the specific job.

So, when you buy a rectifier, check its heart. Make sure the one you buy offers the most advanced design for longest life . . . In other words, make sure you get a Rapid Rectifier.

*In forced air cooled, three phase, full wave bridge circuit units.
**All three phase rectifiers are designed with a full wave circuit.



THE NAMEPLATE THAT MEANS *"More Power to You!"*

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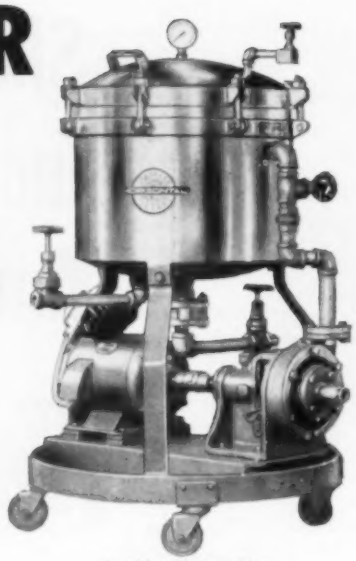
SPARKLER

HORIZONTAL PLATE

FILTERS

FOR LOW COST FILTERING OF PLATING SOLUTIONS AND CARBON TREATMENT WITHOUT SHUT DOWN

HERE'S HOW



Sparkler Plating Filter
Model 18-D-6 Alliron
600 G.P.H. Portable

On a horizontal filter plate it is possible to apply a thin pre-coat with about one-third the filter aid, and in one-third the time required for pre-coating a non rigid media or a surface in a vertical position. This saves time and filter aid.

Where several tanks are to be filtered, the Sparkler filter can be shut down after filtering the first tank and moved to the next one without danger of disturbing the filter cake. This saves pre-coating time and filter aid usually required to re-coat a bag-type filter.

A filter cake on a horizontal plate will not crack, slip or fall off even with varying pressure or a complete shut-down of the filter. No pre-coat renewal is ever required after an interruption in operation.

When it is necessary to clean the filter, the Sparkler filter tank can be emptied in a matter of minutes with a minimum loss of valuable plating solution.

Any grade of filter paper from fine to coarse can be used in a Sparkler filter. This makes it ideal for carbon treatment of solutions. Carbon mixed with water in a stand-by tank is circulated through a clean set of filter paper on the plates until a carbon cake is formed. The solution requiring carbon treatment is then circulated through the carbon beds without contaminating the plating tank or a shutdown of plating operations.

At the end of the cycle with a Sparkler filter you can blow-down with air and produce a relatively dry cake that can be disposed of in a trash can rather than washing it down the drain with attendant sewer clogging problems.

You will find your Sparkler plating filter positive and dependable from a standpoint of uniform high quality filtering and economical in labor and material.

Write Mr. Eric Anderson for personal service.

Sparkler representatives in all principal cities are ready to give you personal service on your filtering problems, and show how you can make a material saving in operating cost.

SPARKLER

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Canadian Plant, Galt, Ontario
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TRADE ~ LITERATURE

L—717. Permanent Magnet Thickness Gage—The General Electric Co. offers a booklet, GEA-6458, 4 pages, describing features, application, specifications, calibration and operation of the hand-held, self-powered instrument.

L—718. Standards—A new 12-page reference booklet on "Metal Finishing Standards" is offered free by The Allen Manufacturing Co. Described by the company as "a real first in the socket screw industry," this new booklet covers the subject of plating and surface treatment of Allen products very thoroughly.

First section of the booklet is devoted to general facts on metal finishing, with a discussion of purposes for various types of finish, thread fits, formulas for calculating thread sizes before plating, quality requirements, hydrogen embrittlement, and protective handling and packaging methods. Second section, arranged in easy-reference table form, covers various types of plating, with a clear statement of advantages and limitations, applications, specifications, and appearance of each type. Third section is a similar table for various types of surface treatment. A corrosion resistance table follows, an outline of test methods, a section on stainless steel, and a listing of specification symbols complete the booklet.

L—719. Fans—A new line of industrial fans designed to handle corrosive and explosive fumes, high temperatures and humidity, abrasive dusts and dirt-laden air is featured in a bulletin compiled by the Propellair Division of Robbins & Myers, Inc.

The six-page, two-color bulletin describes the applications for the belt-driven tubeaxial fans and the requirements for use under special conditions such as high temperatures, corrosive exhaust and outdoor installation. Photographs, cross-section drawings and charts illustrate features of the fans, which are available in two types—for applications at normal or high temperatures.

Complete information on the construction features, accessories, bearing assemblies and performance of the five fan sizes, ranging from 16 to 36 inches, is included in the bulletin. The fans have air delivery ratings to 26,000 cubic feet a minute.

DON'T MISS
THE AUGUST ISSUE
ON
WATER AND WASTE

Whether it's a carload
or a handful, you're

ON THE RIGHT TRACK

when you ship us your

NICKEL PLATER'S SCRAP

We're always in the market
at top prices

*For prompt quotation
send us a 5-lb.
representative sample
of your accumulation*

Invoice us for sample . . . or we will pay on basis of laboratory analysis.

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Super-Market for ANODES

buy DIRECT from METAL CONVERTER

Nickel anodes up to 93 inches in length —cast in new shell mold process. This unique method of casting produces anodes of the highest purity—with optimum metallurgical properties. Density of anodes is at a maximum and excellent surface is obtained. These factors account for longer life in plating bath.

NICKEL RECASTING PRICE SCHEDULE

ANY QUANTITY only 99+ purity accepted

15c PER POUND

FOB UNIVERTICAL

Laboratory Controlled

Write or wire for best price and delivery on the following Anodes:

Copper-Electro Deposited	Phos. Copper
Copper-Cast Round 3" Dia.	White Brass
Copper-Cast Round 2½" Dia.	Zinc
Copper-Cast Beehives	Tin
Copper-Cast Balls	Lead
Copper-Forged Balls	Carbon
Copper-Rolled Oval 1½" x 3"	

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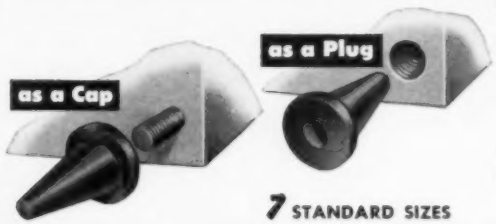
SINCE 1939

For Metal Finishers!

Pressure Moulded NEOPRENE **"CAPLUGS"**



7 STANDARD SIZES

	A	B	C	D	E	F	G
TO PLUG HOLE SIZE	1/8-3/16	3/16-1/4	1/4-5/16	5/16-1/2	1/2-5/8	9/16-11/16	5/8-3/4
TO CAP STUD SIZE	3/32-5/32	5/32-3/16	3/16-1/4	1/4-5/16	5/16-3/8	3/8-7/16	5/16-1/2

MASKING PROBLEMS OUR SPECIALTY!

WRITE FOR **FREE** SAMPLE KIT.

DUGGAN Masking Devices

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DETROIT 16, MICHIGAN

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ZINC PLATERS:

FOR QUALITY PERFORMANCE AT LOWEST COST, purify cyanide zinc plating solutions with

McKeon's Zinc-Brite

Regular use keeps zinc solutions constantly clear. Eliminates need for ANY OTHER purifying treatment. Brightens work.

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Sulphur Products Co. Inc.
228 McKeon Way
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USE READER SERVICE CARD; INDICATE A 725.

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BALTIMORE WASHINGTON BRANCH

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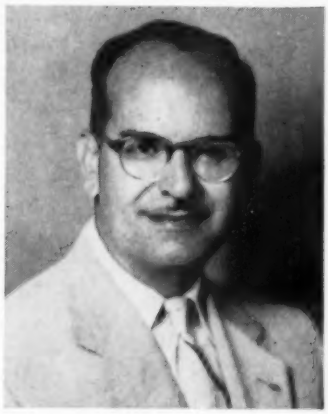
Vice-President



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"pH PAPERS"

Accurate ph values in a few seconds right at the tank.

These are the original "pH Papers" invented and produced by an outstanding German chemist. Guard against imitations using similar designations.

Indicator AND control-colors on SAME strip. Control-colors in steps of 0.2 pH and 0.3 pH.

Plating ranges
(200 strips of a range per box)

No.	Acid:	No.	Alkaline:
4862	(•4.8–6.2 pH)	6680	(6.6– 8.0 pH)
3650	(•3.6–5.0 pH)	7387	(7.3– 8.7 pH)
2439	(•2.4–3.9 pH)	8610	(8.6–10.0 pH)
1028	(1.0–2.8 pH)	10113	(10.1–11.3 pH)
0414	(0.4–1.4 pH)	11131	(11.0–13.1 pH)

•Electrometric Values in Nickel Solutions.

Each range is boxed separately.

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NICKEL ANODES

Cast and Rolled
All Lengths

Prompt Delivery

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ROCHESTER DEC 17 1954 N.Y.
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NEWARK AUG 12 1956 N.J.
MINNEAPOLIS AUG 15 1956
MUSKEGON, MICH.
RICHMOND AUG 11 1
WATERBURY 1955 CONN.
BROOKLYN, N.Y. AUG 21
PROVIDENCE SEP 7 1955 R.I.
TAMPA SEP 21 1955 FLA.
SAINT LOUIS MO.
WASHINGTON, D.C.
PITTSBURGH, PA. AUG 16 1956
ATLANTA AUG 19 1956 GA.
KANSAS CITY AUG 10 1956 MO.
DALLAS, TEXAS NOV
SPRINGFIELD AUG 12 1955 MASS.
LOS ANGELES AUG 11 1956 CALIF.
LONGMONT SEP 27 1956 COLO.
TORONTO, ONTARIO AUG 24 1956 CANADA
DETROIT, MICH. AUG 11 1956
LOUISVILLE AUG 15 1956 KY.
ROCK ISLAND OCT 1 1955
CHICAGO AUG 19 1956
GRAND RAPIDS MICH.
WASH.
AIKEN S.C.
HARTFORD AUG 15 1955 CONN.
WICHITA DEC 13 1954 KANS.
LOS ALAMOS JAN 4 1956 N.MEX.
TACOMA JAN 11 1956 WASH.
MILWAUKEE AUG 11 1956 WIS.
PHILADELPHIA, PA.
SAN DIEGO FEB 9 1956 CALIF.
ROCKFORD AUG 12 1955 ILL.
NEW HAVEN AUG 13 1956 CONN.

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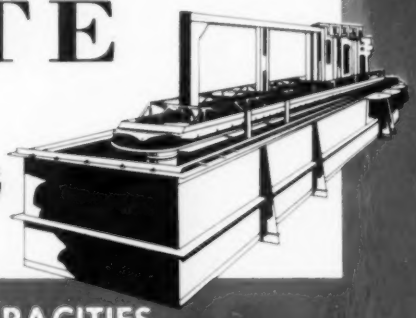
PLATING and PROCESSING MACHINES



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   Rack Capacities in excess of 1000 pounds available
2. **LARGEST RACK SIZES**
   Up to 7 feet wide, unlimited depth
3. **LARGEST CURRENT CAPACITY**
   Built for racks requiring up to 5000 amperes
4. **REQUIRES MINIMUM MAINTENANCE**
   Easy to service with all mechanism above tank level
5. **STRONGEST—MOST RUGGED MACHINE**
   Lift accomplished by powerful bridge-type super structure
6. **REQUIRES LEAST FLOOR SPACE**
   Smallest center island—shortest length
7. **MOST FLEXIBLE MACHINE**
   Rack spacing variable to suit processing requirements
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9. **A FOOL PROOF MACHINE**
   Positive hydraulic overload protection on lift and transfer
10. **MINIMUM INSTALLATION TIME AND COST**
    Completely built and test run at Udylite plant
11. **FINEST REPUTATION AND ACCEPTANCE**
    Over 700 hydraulically powered full automatics sold
12. **UNMATCHED SERVICE POLICY**
    No cost service before and after installation

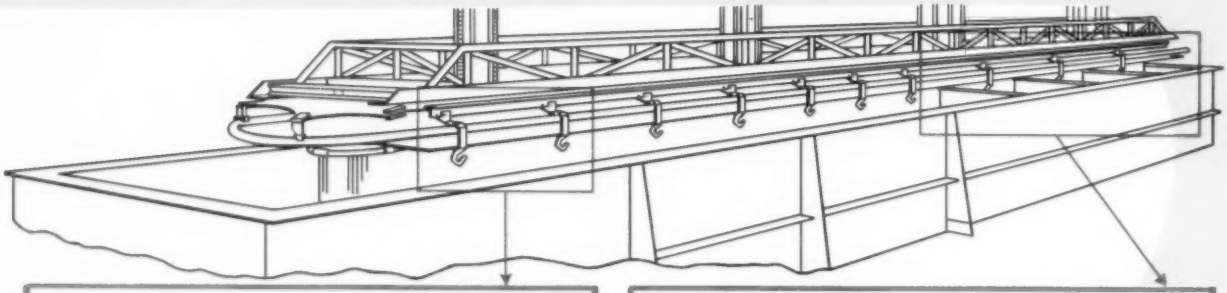
THE Udylite CORPORATION
DETROIT 11, MICHIGAN

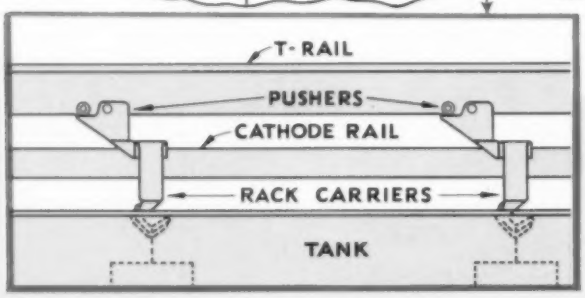
WORLD'S LARGEST PLATING SUPPLIER

ONLY UDYLITE MACHINES GIVE

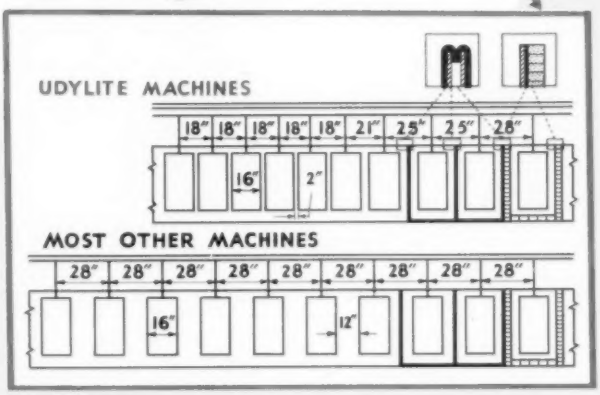
VARIABLE RACK SPACING—The drawings on this page illustrate the operation of Udylite exclusive variable rack spacing. A study of this and following pages will show the advantages of Udylite design. Here is how variable rack spacing will benefit you.

1. Allows for greater number of racks for any given length of machine. **2.** Saves on total machine length. **3.** Reduces floor space required in processing tank. **4.** Rack centers can be selected for best processing efficiency in that solution independent of rack centers in other tanks. **5.** Saves in gallonage of processing solutions required.



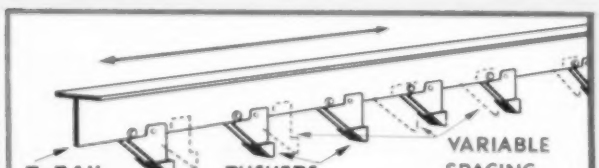


Udylite racks can be placed in the tanks exactly where you want them. This is accomplished by Udylite's ingenious but simple pusher mechanism. It eliminates the use of gears and chain which requires set distances of forward movement. Variable rack spacing allows *unlimited choice of rack centers in transfer or plating* for best operating conditions.

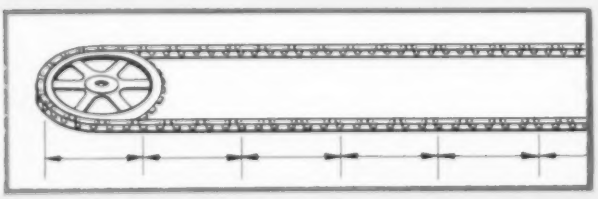


In the Udylite machine, different rack centers are no problem. They can vary in each tank regardless of different tank wall thicknesses. Rack center measurements in each processing tank are therefore chosen for the *best* processing efficiency in a particular solution regardless of the required centers in other tanks or the centers in transfer. In most other machines all rack centers are the same and are based on the width of the largest rack center used on the machine. The advantage of Udylite design is shown by the illustration above. In this example, one tank is brick lined, two are KOROSEAL* lined and the processing tank is steel. To obtain a 4" rack clearance from tank walls, Udylite design allows for a minimum in rack center measurements where tank walls vary in thickness and permits a 2" rack clearance in the processing tank. As can be seen, the Udylite machine will save 63" in rack spacing for ten racks when compared to the spacings of other machines.

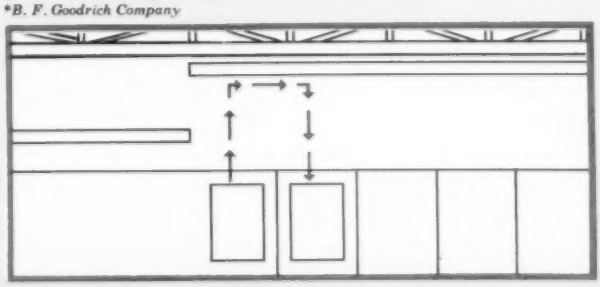
B. F. Goodrich Company



The exclusive Udylite pusher system works from a T-rail which moves back and forth. It operates hydraulically. Pushers are attached to the T-rail and can be positioned at any desired spacing. Future changes in rack size or plating time may be easily accommodated by simple change of pusher spacings.

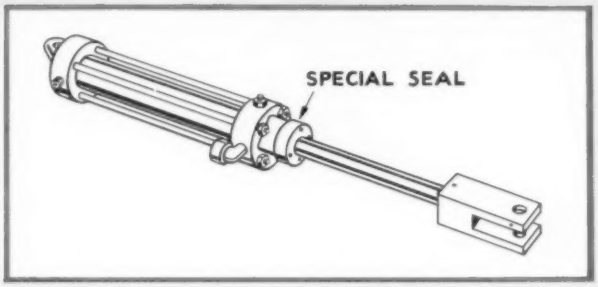


Udylite pusher system eliminates fixed carrier spacing necessary with chain driven machine.

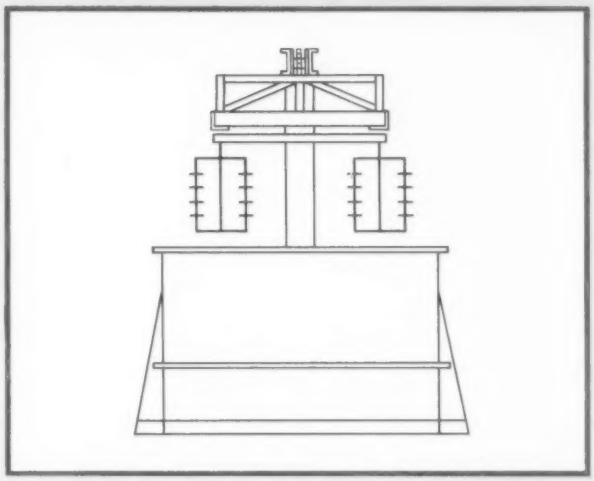


When work is transferred from tank to tank, all action is by square motion. This means minimum of forward travel.

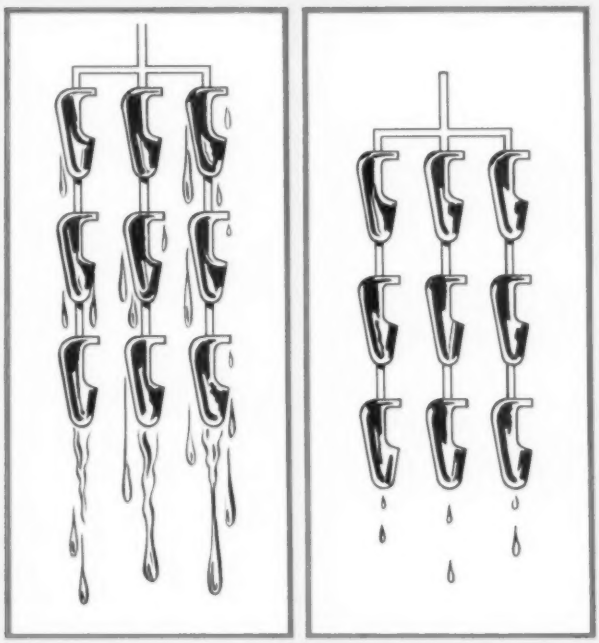
THESE OPERATING ADVANTAGES



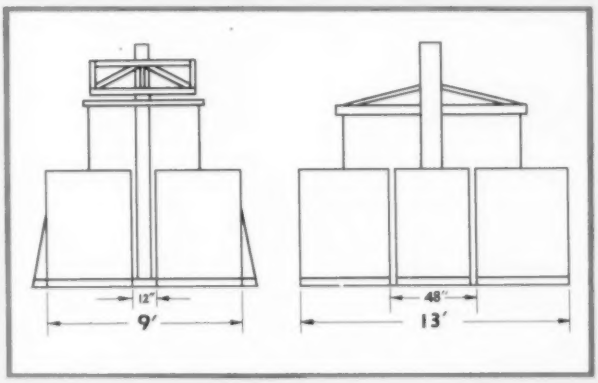
Lifting, horizontal movement and lowering of racks is done smoothly, effortlessly without jar or jerk by low-pressure hydraulic power with *separate speed controls for each movement.*



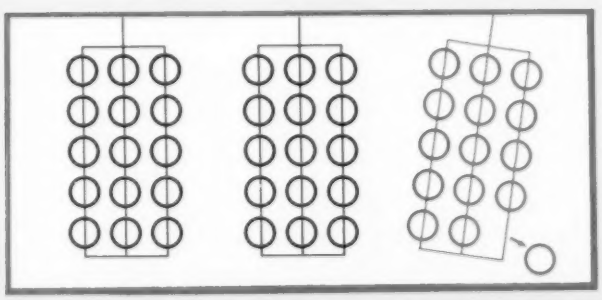
On Udylite machines, all work is lifted by powerful bridge-type superstructure, activated by a *low-pressure* hydraulic unit. Superstructures available for lifting racks in excess of 1000 pounds. There are no weight limiting arms on Udylite machines.



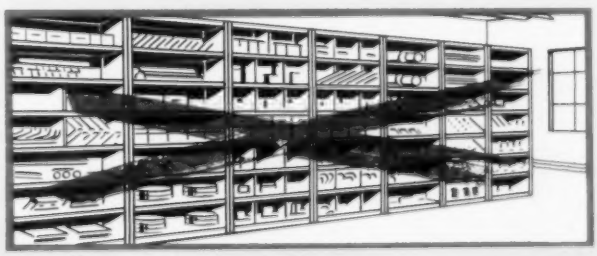
The smooth action of the hydraulic lift, usually set at not more than 40 feet per minute, greatly reduces dragout and solution contamination. The slow lift of work carriers allows surface tension to "wipe" most of the solution from the plated parts.



Most Udylite machines take up only twelve inches between tanks as compared to approximately forty-eight inches on other machines. *They are built and shipped on their own base.* As railway flat car or truck width limits are ten feet, this means Udylite machines can be shipped by truck or railway car in sections with tanks mounted do not need dismantling after factory run-in.

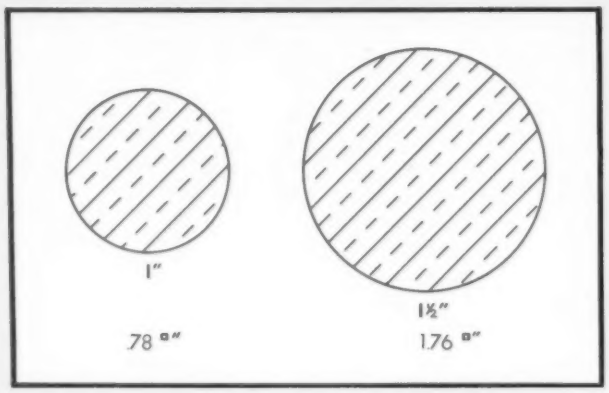


Use of hydraulic cushioned power and square transfer eliminates all whip and sway, even on racks up to eight feet long.

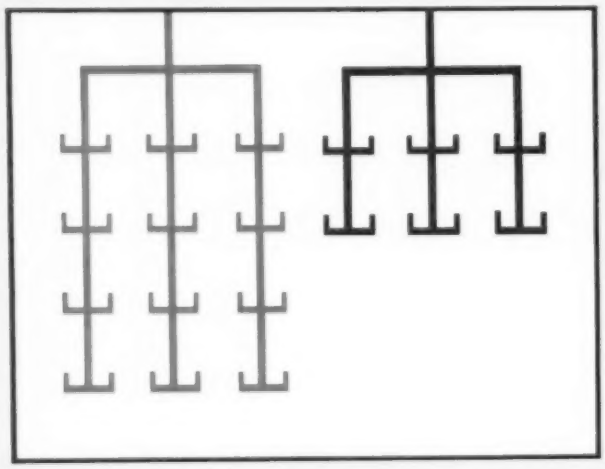


Because of its simplicity of design and fewer working parts, the stock of spare parts recommended for the Udylite automatic is amazingly small.

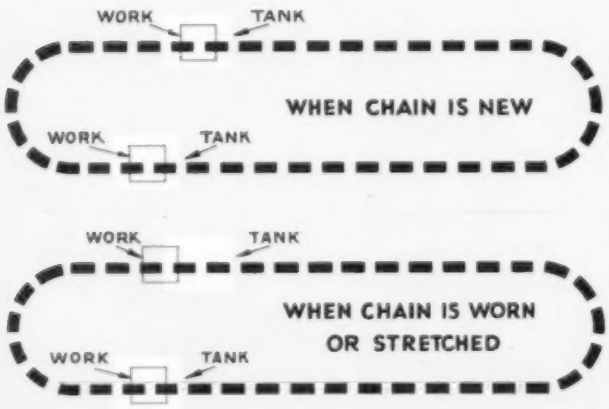
EXCLUSIVE UDYLITE OPERATING ADVANTAGES



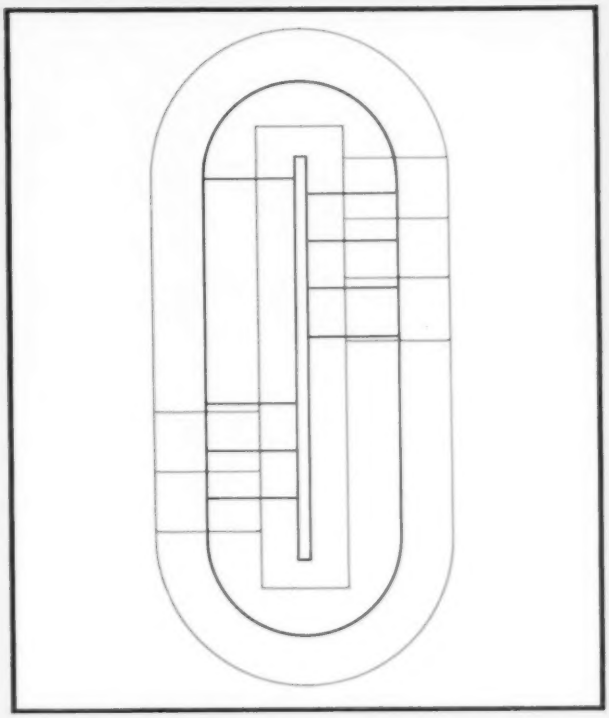
Udylite uses copper anode rods of 1½" diameter as standard. This allows for more current capacity. There is no sagging of rods under heaviest anode loads.



Only with the Udylite machine does the principle of operation readily lend itself to racks of extreme depth and up to 7 feet in direction of travel.



Udylite work carriers are positioned by pushers positively and exactly. Malfunction, due to chain stretch, wear or overtravel completely eliminated.



For an equivalent cycle and number of plating racks a Udylite machine will save approximately 4 feet in width and 20 percent in length.

UNMATCHED SERVICE POLICY

Before shipment of any Udylite machine, a layout print is mailed to the customer. This enables him again to check dimensions, make arrangements for water and electrical lines, for drainage, for steam and ventilation outlets. After checking, the print is returned to Udylite with the customer's approval.

After the return of the layout print and before actual shipment of the machine, a Udylite service man visits the customer, inspects the site, checks dimensions, water and electrical lines and other details preparatory to the installation of the machine. When the machine is built, the customer is notified and can make an inspection of the machine *in operation* at our plant. The customer is then notified of the date of shipment and arrangements are made for a Udylite service man to be at his plant when the machine arrives to assist in the installation.

A regular service program is a part of the Udylite policy. Each customer receives a routine call from a thoroughly trained and experienced Udylite factory service engineer once each six months to check the machine. And, of course, electrical, chemical or mechanical specialists are on call for any emergency. *These services are without cost to purchasers of Udylite Automatics.*

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DETROIT 11, MICHIGAN

WORLD'S LARGEST PLATING SUPPLIER

REPORTS FROM ALL OVER . . .
STRIPPED, CLEANED, DEGREASED

Lyman B. Sperry sent in the following suggestion:

●

There is a very simple, inexpensive way to establish foolproof control of water flow in rinse tanks, despite variation in water pressure over wide limits (15–125 psi). The rate of flow desired must be predetermined. There is a unit called the Dole Flow Control Valve (actually not a valve), manufactured by the Dole Valve Co., 1933 Carroll Ave., Chicago, Ill., which is simple and inexpensive. Various sizes are obtainable which will deliver any fixed amount of water from 15–600 gph. The unit contains an ingenious flexible orifice which varies its size uniformly and inversely in proportion to the pressure. It was intended for use in controlling water flow rates for plumbing fixtures, but it is a "natural" for the plater.

●

Refining of platinum and rhodium via ion exchange: Alloys can be refined by extraction of simple cations from aqueous solutions of the precious metal complex chloride salts with Dowex-50 in the sodium form; the exchange removal is about 98.5 per cent efficient. The process is much cheaper, simpler and quicker than classical methods of separation.

●

Cleanability of metallic surfaces for finishing operations and oil-spreading rates: If a sample of the oil on the metal articles is available, the approximate time of cleaning can be predicted by knowing only the spreading rate of the oil.

●

Because of the tight supply of nickel chemicals, Harshaw Chemical Co. arranged its Monel reclamation unit to make nickel chemicals from nickel-copper scrap (these include the carbonate, chloride, acetate and sulfate).

●

Lithium metal in commercial amounts is available from Foote Mineral Co.'s new metal cell at Exton, Pa. The 1-lb ingots are packed under oil in sealed steel cans.

●

A continuous countercurrent ion exchange unit, developed by R. Porter, Salt Lake City, reportedly was bought by DuPont. Peterson Filter, SLC, is building a full-scale, $18,000 operating unit, using a slug system in a moving bed to remove the resin for elution or regeneration. Fresh resin, fed to the reactor column at top, is suspended in reactor chamber by force and volume of entering pregnant liquor.

●

Anodized aluminum wire: In Aluminum Ltd's process, the aluminum wire is pulled through tanks containing "chemical solutions" which quickly give it a thin, hard coating at commercial speeds. The oxide coating is said to maintain its insulating properties at very high temperatures and is ductile enough to be used in winding electrical coils.

●

Fisher reagents are now available in Dispos-It no-deposit acid cases and bottles fitted with dripless sleeves.

●

A new fluorine compound, perchloryl fluoride, ClO_3F, the acid fluoride of perchloric acid, will be available soon commercially from Pennsylvania Salt as a powerful oxidizing agent. The colorless gas is said to be non-corrosive, thermally stable, not to be hydrolyzed by hot water, only slowly decomposed by alkali solutions.

●

A new field strength meter can measure electric currents of one-thousandth of a trillionth of an ampere, according to Minneapolis-Honeywell Reg. Co.

●

EFCO-Udylite 514 brightener nickel plating process is one in which the new solution is prepared by adding three brightening agents, and one antipitting agent to a basic solution containing nickel sulfate, nickel chloride and boric acid.

●

Margin plating cuts tin use in cans: Plating only the narrow margins of the steel plate which form the soldered side seams of cans (with the rest of the can being enameled steel plate) promises to take 98 per cent of the tin out of more than 10 billion tin cans, according to American Can Co. Production of cans for beer, coffee and food by the new method may save up to 5,260,000 lb of tin/yr according to R. Lueck.

●

Allied Chemical & Dye Corp's method for recovering contaminated or spent chromic acid solutions typical of chromium plating, anodizing and copper stripping operations was made generally available for industrial use (US Patent 2,733,204). It involves ion exchange treatment for removing metallic contaminants by passing solutions through a cation exchange resin consisting of a sulfonated infusible polymerizate of polyvinyl aryl compound.

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BOOKS

Chromium—Volume I edited by Marvin J. Udy. 640 pages; $8.00; AES Member $6.80.

Brings together in two comprehensive volumes the very latest, authoritative data and knowledge on all phases of the manufacture and use of chromium metal, chromium alloys and chromium chemicals. Volume I contains the chapters of most interest to the chemist and manufacturer. Volume II contains the chapters of particular interest to the metallurgist. Thirty-five top experts in the particular phases of the subject offer here the very best data and knowledge to date on chromium and its production, the production of chemical compounds and refractories and their use in the chemical, refractory and metallurgical fields. Volume II will be published in July or August 1956. Despite the fact that Volume I is not directly applicable in all of its parts to the chromium plater as such, it should prove of some value together with Volume II in spanning the entire panorama of a metal which has now become primary. This is true on the basis of the fact that in order to understand any one part of the field well, it is necessary to know the entire field. This book is strongly recommended to men in the metal finishing industries.

Symposium on Basic Effects of Environment on the Strength, Scaling, and Embrittlement of Metals at High Temperatures. Heavy Paper Cover, $2.75, AES members $2.50.

Since most of the creep and creep-rupture tests from which design data on high-temperature alloys can be obtained are carried out in normal atmospheres, and since most high-temperature materials are used in atmospheres of water vapor or some products of combustion, the design engineer must always be concerned with the effects of the environment upon the creep rate and the ductility of the materials that he uses.

It was with the hope of contributing to the understanding of these effects that the General Research Panel of the ASTM-ASME Joint Committee on Effect of Temperature on the Properties of Metals decided to sponsor this Symposium. It was felt that there must be data on oxidation and surface effects and on creep under controlled atmospheres that the panel could collect in one publication, and that by so doing further work in this field would be stimulated.

It is believed that the papers which make up this Symposium represent accurately the status of the problem of environment at the present time.

Corrosion and Its Prevention at Bimetallic Contacts 25 c.

This booklet has been published by H.M.S.O. on behalf of the Corrosion and Electrodeposition Committee of the Inter-Service Metallurgical Research Council. (Admiralty and Ministry of Supply.)

It is an attempt to provide up-to-date and reliable information on the subject, primarily for the benefit of designers in government departments and government contractors although it should be of considerable interest and value to all who are, or should be, concerned with metallic corrosion.

The text provides general information about the conditions in which bimetallic contacts are most likely to lead to troublesome corrosion and also about the means of mitigating such effects. This should be read in conjunction with the Table which follows. By a system of symbols it indicates the relative effects on the corrosion of a range of metals when brought into mutual contact and bridged by water containing an electrolyte. The Table is arranged in two main groups of metals, the first in sequence approximately similar to the "Schedule of Potentials" included in many documents. The second group comprises chromium, stainless steel, titanium and aluminum, which metals develop highly protective oxide films and behave as relatively noble metals under conditions favourable to the maintenance of such films but are in some cases less resistant in conditions in which break-down of the films is possible. It is these metals in particular that cause difficulty in attempting to predict the behaviour of bimetallic contacts from a schedule of potentials.

Our Plating Industry—1955-1956 Directory. 309 pages.

This work, long heralded and definitely needed hardly begins to fulfill the promise held out by its authors. Far from being a Directory, this book unfortunately falls short by far in all of its categories. Its geographical listing fails to include all of the companies in the cities given. In the classified section, the omissions are as distressing as some of the inclusions. For example, under "Rectifiers" the largest manufacturer is not listed; under "Fine Silver Anodes" only one company is listed; under "Apparel" the two largest known progressive and aggressive companies do not appear; under "Automatic Electroplating Conveyors," the largest manufacturer installer does not appear.

This directory would have us believe that only two companies in the US make plating barrels—the same is true for tumbling barrels. All in all, despite the fact that this is a start, the feeling among most reviewers is that it is completely inadequate and unworthy of its title and the industries it purports to serve.

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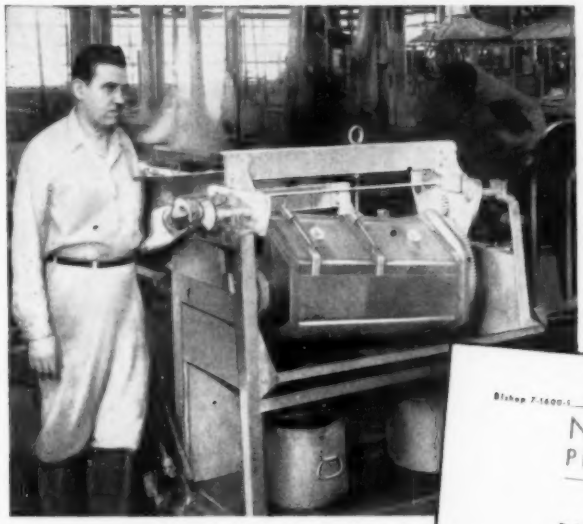


gives us

"more uniform distribution of plate according to quality control checks

"noticeable color improvement on brass plating

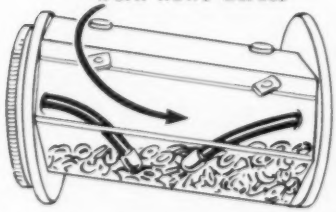
"20% increase in load sizes."

Says Paul Glab,
Superintendent of Plating,
Northwestern Plating Works, Chicago.

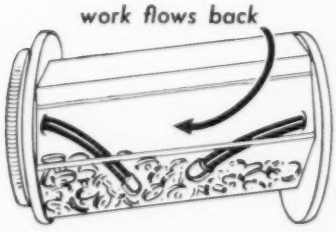
Improved Quality Control and increased production with lower cost are a cinch with this new BELKE Plating Cylinder.

The cylinder oscillates as it rotates

work flows across



work flows back



all sides of all parts are equally exposed to plating current. No part of the load stays at the ends where little plating occurs. No parts stay buried with greatly reduced exposure to plating current

Do you realize that this 20% saving in plating cost is all profit you are not getting now!

Bishop 7-1600-1

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PLATING WORKS

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March 23, 1956

Belke Manufacturing Co.
947 N. Cicero Avenue
Chicago 51, Illinois

Gentlemen:

In reply to your inquiry, our Belke Double Oscillating Plating Barrel is giving much greater improvement in plating results than we had anticipated.

Quality control checks show plating thickness is much more uniformly distributed. The over plating of some parts and under plating of others, that occurs with conventional plating cylinders, is avoided.

The improvement is particularly helpful in plating washers and other flat parts which so often come through partially plated because the parts stick together.

We have used the double oscillating barrel on brass, zinc, and cadmium plating with equally good results. On brass plating work it gives a noticable improvement in color.

In addition, we have increased the load size 20% while turning out the best plating work we have ever produced.

We consider the new Belke barrel an important asset to our operation and will be glad to show it to other platers who are interested.

Very truly yours,

NORTHWESTERN PLATING WORKS
Paul Glab
Paul Glab, Supt. of Plating

Ask your BELKE Service Engineer or write for literature.

Belke Manufacturing Company
947 N. Cicero Ave., Chicago 51

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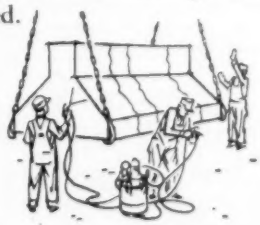

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1A. Good Bond. Little or no peripheral swelling 1B. Poor Bond. Excessive peripheral swelling 1C. Poor Bond. Chromium peeled

Figure 1

A MINIMUM DESTRUCTION TEST FOR THE ADHESION OF HARD CHROMIUM DEPOSITS

By Dr. Hyman Chessin* and John G. Poor†

ABSTRACT: Visual and low-magnification observation of a small indentation made to a predetermined depth in hard-chromium plated articles can determine whether the adhesion is or is not adequate. The method is applicable to production items where a small indentation may be tolerated.

INTRODUCTION

The need for a nondestructive test for adhesion of electrodeposits is well established. Such a test, satisfactory for production items, has not been developed. As Blum and Meyer point out in a section of a book edited by Gray[1] . . . "there is at present no quantitative method for measuring the adhesion of plated coatings on finished articles of varied shapes." The adhesion of chromium electrodeposits may be quantitatively determined,[2, 3] but the methods are applicable only to prepared laboratory specimens.

In the case of low-cost items which are produced in large numbers, samples may be removed at intervals from the production line and their adhesion qualitatively tested by the usual grinding, bending or chiseling methods. Even this is not practical for expensive work pieces such as plated diesel cylinder liners.** Since available adhesion tests involve total or nearly-total destruction, such bond checks may be made only on prototypes. Even these must be made at undesirably infrequent intervals because the number of scrap liners is limited and the lost production capacity in plating such liners is costly. Furthermore, the statistical validity of extrapolating to other plated liners the results found on the prototype liner is doubtful.

The test method‡ described here largely solves the problem of determining plate adhesion in a practical manner by causing such slight damage that it may be tolerated on many production items.

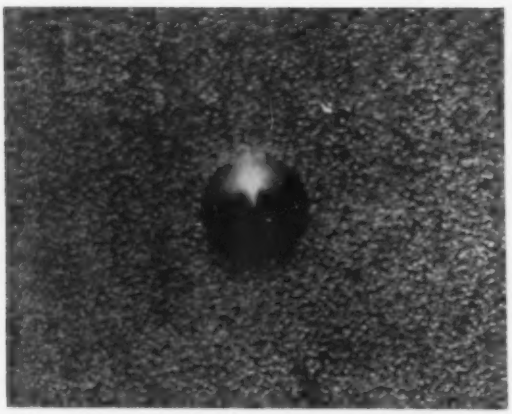
THE TEST METHOD

The method involves pressing a hard indenter with a hemispherical end into the chromium plated metal to a given and predetermined depth and examining the edges of the indentation. Where the bond is sufficient for the most extreme service conditions, the periphery of the indentation is undisturbed with the possible exception of some minor radial cracks apparent only under magnification. In every case where the bond is inadequate and liable to failure in such service, the chromium at the edge of an indentation of proper depth will either spall or peel away in flakes from the basis metal or will show peripheral swelling to give a volcanic-cone appearance. In a few cases of good adhesion there will be some crumbling of the chromium at the edge of the indentation. Examination with a binocular microscope readily determines whether this is crumbling only in the chromium, a sign of good bond, or whether there has actually been parting of the plate from the basis metal. These cases are illustrated in Figure 1.

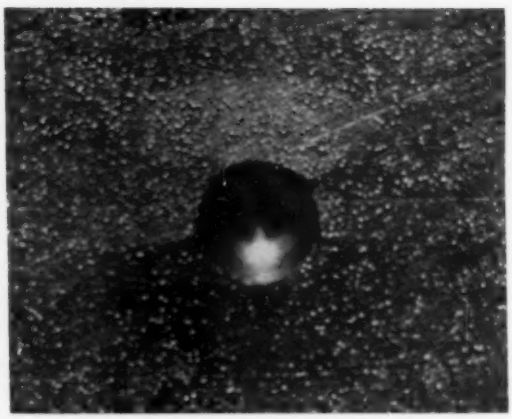
Geometries other than the hemisphere are suitable, but the hemisphere has been found to be convenient. Two hemispherical indenters have been used with success. One with a 1/16-inch radius is indented a depth of 0.025-inch and the other with a 3/64-inch radius is indented a depth of 0.020-inch into a hard-chromium plated cast iron. The former makes a circular hole 0.100-inch in diameter at the

* Assistant Director of Research.
† Director of Research, Van der Horst Corp., Olean, N. Y.

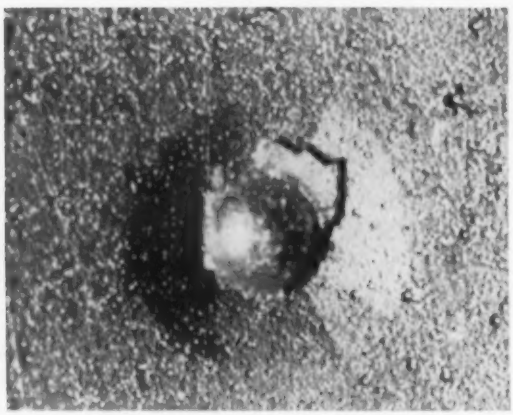
** As carried out at the Van der Horst Corp.
‡ Patent applied for.



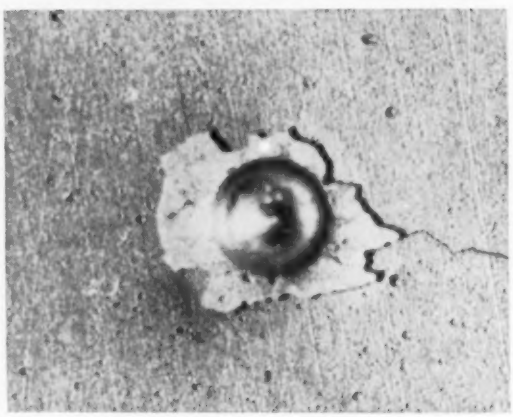
2A. Good Bond



2B. Poor Bond. Excessive Peripheral swelling



2C. Poor Bond. Swelling with Spalling



2D. Poor Bond. Extensive Spalling

Figure 2

surface; the latter, 0.077-inch. For diesel cylinder liners where the piston rings are wider than these values, no oil blow-by is encountered and the test may be made on each work piece. Examination of the hole by skilled personnel can definitely classify the adhesion as being adequate or otherwise.

Calibration for the depth of penetration is not difficult. Plated samples, the adhesion of which have been previously classified by a quantitative method as poor or good, are indented with a series of increasing depths of penetration. The proper depth of penetration with a given penetrator will cause little or no disturbance of the periphery on samples with good bond, will cause peeling or swelling on those samples with poor bond, and in most instances visual examination without a microscope is sufficient for differentiation. Too great a depth of penetration will cause excessive deformation and even well-bonded specimens will exhibit peripheral swelling such as that in Figure 2b. Spalling will be found and every indentation must be examined under the microscope to determine whether this is spalling of chromium from chromium or whether there has been clean parting at the interface. Furthermore, indentations of excessive depth increase the area of damage to an extent which may be objectionable in the use of the article.

It is well to emphasize that the demarcation between poor and good adhesion depends on the calibrating specimens. Definition of their adhesion is determined by service requirements.

Variations in thickness of chromium such as would be applied to engine cylinder bores have little effect on the test results and their interpretation.‡ Perhaps this is because of the lack of ductility of chromium.

Numerous tests were made to correlate these results on scrap liners the bond of which was known either to be unserviceable or to be good. The photographs in Figure 2 made with oblique lighting to show swelling, picture typical examples.

THE INDENTER

The indenter for use in engine cylinder bores is a modified C-clamp which has the tungsten-carbide penetrator

‡ This would indicate a probable thickness range of 0.003 inch to over 0.010 inch.

mounted in a screw on one side and a small hydraulic ram mounted in an integral housing at the other. The position of the ram in its housing is determined by a calibrated screw. This assembly is shown in Figure 3. In use, the piston, fully extended under mild pressure, is placed back of the plated metal and the penetrator is screwed forward to contact the chromium plate. When contact is firm, the calibrating screw which shifts the position of the whole ram is turned to advance the ram at a distance equal to the depth of penetration desired. When the pressure in the ram is then increased, the piston moves to its original fully-extended position causing the penetrator to indent the electrodeposit by the given amount.

Any device which can cause indentation of the penetrator to a controlled depth may be used. For instance, for penetration of deposits on flat or outer surfaces, slight modifications should make a Rockwell-type hardness tester suitable. Even a simple screw arrangement can be adapted.

Figure 3

DISCUSSION

This test for the adhesion of hard-chromium deposits is applicable to production articles where a small indentation is tolerable. Although it has been used mainly for hard-chromium deposits on ferrous metals, the principle should be applicable to other deposits on other basis metals. Since the principle depends upon differential deformation of electrodeposit and basis metal, it will be apparent that the severity of the test will vary as different electrodeposits and basis metals are indented. Consequently, the depth of penetration and even the penetrator size and geometry may require adjustment in various instances. For example, the adhesion of chromium to aluminum has been checked by changing the depth of penetration. The indenter has not been used for electrodeposits other than chromium.

The method is the basis for a "go-no go" test of adhesion. This is the most desirable type of test for a production item. Ideally the entire significant area of a plated piece would be tested for adhesion and, of course, the described method cannot accomplish this. However, this method does provide a means of testing a limited area of every work piece provided there is tolerance for the relatively small indentation.

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Dr. Hyman Chessin was born in Cleveland, Ohio in 1920. Graduate work in electrodeposition and electrochemistry at Western Reserve University, Cleveland, Ohio led to the PhD degree in physical chemistry in 1951.

Teaching and research in electrodeposition at Kenyon College, Gambier, Ohio, and research at the Institute of Science and Technology, University of Arkansas, Fayetteville, Arkansas was followed by the present appointment in 1954 as Assistant Director of Research for the Van der Horst Corporation of America, Olean, New York.

Dr. Chessin is a member of the AES, the ACS, the Electrochemical Society, the Electrodepositors' Technical Society, London, Sigma Xi and Sigma Pi Sigma.

John G. Poor joined the Van der Horst Corporation of America as plating chemist in 1943 and was appointed to his present position, Director of Research, in 1948. Poor's first laboratory experience was gained while with the General Electric Co. for a 5 year period. As further preparation for his present position, he was employed for 10 years as plating chemist at the Underwood Corp. Research Laboratory. He is a member of the AES and the Electrochemical Society.

PLATING OF ZINC DIE CASTINGS

by K. W. Howard*

INTRODUCTION

This paper is a description of a manually operated plant, for the copper, nickel and chromium plating on zinc base die castings.

Briefly, the sequence of operations is:

(1) Degrease in trichlorethylene
(2) Alkaline clean (electrolytic)
(3) PR Cyanide copper plate
(4) Bright nickel plate
(5) Chromium plate
(6) Inspect and pack

The basic requirement for plating is a good sound casting, both in alloy composition and in surface finish. The alloy most used is of the following composition (See Table 1).

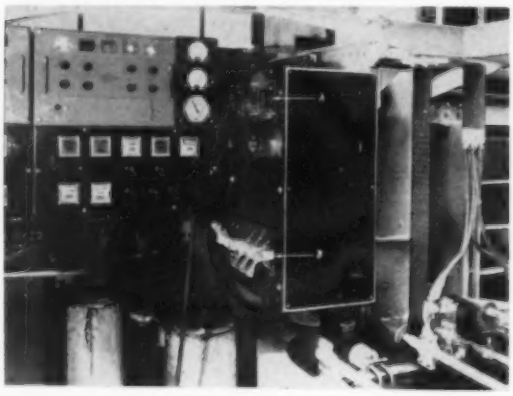

FIGURE 1

TABLE I

	EZDA Composition 1955
Aluminum	3.9–4.3 per cent
Copper	0.03 (max)
Magnesium	0.03–0.06
Iron	0.075 (max)
Lead	0.003 (max)
Cadmium	0.003 (max)
Tin	0.001 (max)
Zinc	Remainder

Herein is to be found a description of methods which differ from those used in the United States. The author's representative states that the original talk from which this was taken has been severely condensed. Much of that which has been omitted is well known to our readers since the subject has been quite fully covered in PLATING. What has been retained should have appeal in that it deals mainly with the use of PR copper on die castings—Ed.

† Lecture to Melbourne (Australia) Branch on July 21, 1955.

* Metallurgist, Die Casters, Ltd., Collingwood, Victoria.

An alloy with similar composition to the above, but with 1 per cent copper is also plated, but is not favored because of its lower dimensional stability and impact resistance.

CLEANING

After lathe polishing of the castings, the first step in cleaning is a thorough degrease in trichlorethylene. This is carried out in a three compartment tank, fabricated of stainless steel and electrically heated. The work to be degreased is received from the polishing shop in PVC covered baskets which are then lifted from compartment to compartment, and finally sent to the racking benches.

From the racking benches, the work proceeds to the alkaline cleaner. This cleaning solution is made of:

Trisodium Phosphate . . . . . 4 oz/gal
Sodium Carbonate (Anhydrous) . . . . . 4 oz/gal
pH 11.4
Temp 200° F

When the work is placed in the solution, it is made cathodic for a time selected from the electronic timer.

After the alkaline cleaner, the parts are rinsed first in hot water then in cold water, followed by an immersion in a weak sulfuric acid solution. This is immediately followed by two more cold water rinses before the parts are loaded into the copper bath.

COPPER PLATING

The copper plating system consists of a glass lined, mild steel tank fitted with ducting for fume removal, a rod agitator, pump, heat exchanger and filter.

The storage tank is situated on a mezzanine floor above the main tank level to allow solution treatment and a weekly inspection of the main tank.

A bag type filter is used in which the top of the bag serves as a gasket between the filter lid and the body of the filter. There is a ground union placed at the inlet which can be unscrewed to permit the charging of the filter with filter aid and activated carbon. The advantage of this type filter is that all solution must pass through the bag at any one time, therefore eliminating the need for a slurry tank, and giving 100 per cent filtration at all times.

The heat exchanger, a steam heated vertical type, allows the plating solution to pass round numbers of steam pipes placed vertically inside the lagged body.

The operator's panel is shown alongside the main tank (Fig. 1).

This consists of primary controls (A, Fig. 1) to regulate the place on current and secondary resistances (B, Fig. 1)

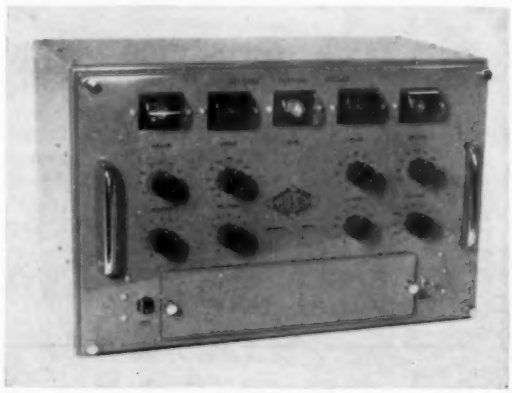

FIGURE 2

to regulate the place off current.

The instrument section of the panel consists of meters, switches for rod agitator, fume exhaust, pump, electric heating boosters, etc. and at the top left-hand corner is the electronic timer.

The timer (Fig. 2) shows four control items:

(1) Master timer (0–110 mins)
(2) Strike timer (0–110 secs)
(3) Plate on timer (0–55 secs)
(4) Deplate timer (0–27.5 secs)

To set this instrument in motion, the control items are set at 20 minutes on the master, 25 seconds on the strike, 4 second plate on time with a 1¾ second deplate time.

The bath is first loaded with work at a current density of 1–3 asf, an activating button is then pressed which brings into play the above conditions at full current density. After the master time has elapsed, the full current density is automatically reduced to 1–3 asf and a bell rings which must be turned off manually.

The composition of the PR Copper solution is:

Sodium Cyanide	5–6 oz/gal
Copper Cyanide	4–5 oz/gal
Rochelle Salts	8 oz/gal
Sodium Carbonate	2 oz/gal
Free Cyanide	0.8–1 oz/gal
	pH–10

Control of these constituents is important as a low free cyanide content will produce blisters, whereas a low metal content will neutralize any smoothing of the deposit with PR and brighteners.

Of the anodes tried, the mechanically worked type have given better results, but even differences in performance have been noted amongst this type which could be due to the presence of phosphorous or arsenic.

In the experiments on PR plating, attention has been paid to the respective current densities of plate on and deplate. After trial and error, the densities have been fixed at plate on 45–50 asf and deplate 25–30 asf.

One disadvantage with fast cycling is the maintenance on the mechanical reversing contactors.

To eliminate this maintenance, an endeavor was made to allow the contactor to make and break at a load considerably smaller than the full load.

Of particular interest is the relative smoothing which takes place in the copper and nickel plating.

The five surface finishes measured are as follows:

(1) Casting after buffing, 1.3 to 2.4 micro inches.
(2) Casting after buffing and 20 minutes of PR copper plating, 0.2 to 0.3 micro inches.
(3) Casting after buffing and 20 minutes of PR copper plating, and 25 minutes of bright nickel plating, 0.2 to 0.3 micro inches.
(4) Casting after 10 minutes of direct copper plating, 0.6 to 1.1 micro inches.
(5) Casting after 20 minutes of direct copper plating, 1.6 to 2.4 micro inches.

The above figures show that considerable smoothing takes place in the PR copper and subsequent bright nickel plating; and by way of contrast, the direct copper plating smoothes then becomes progressively rougher.

NICKEL PLATING

The plant for nickel plating using high chloride solutions, consists of a Duriron Pump, heat exchanger and a filter (similar in design to that used in the copper plating system), all of which are connected in series with the main tank. The rubber lined main tank has as an integral part of its construction a "plating-out" section which receives the nickel solution from the working section of the tank through a cut-away in the wall separating these two compartments.

By altering the valves, the solution may be pumped up to the storage tank situated on a mezzanine floor to allow periodic solution purification.

To offset corrosion, the steel shells of the main tank and filter body are connected with the cathode through a small resistance in an endeavor to make them plate on in the event of the rubber puncturing.

Another electrical device is a PVC covered float switch which rings an alarm should the solution level fall below a predetermined point to prevent any solution leakages when the bath is unattended.

To keep organic impurities at a minimum, the baths are covered with canopies to minimize dust pollution. The rod agitator pinions are made of nylon to eliminate grease and all tap water is filtered before addition to the plating solution.

CHROMIUM PLATING

The chrome plating tank is lined with rigid PVC sheeting and the solution is steam heated controlled thermostatically.

Prior to chrome plating, the articles are dipped in a 2½ per cent sulfuric acid solution to which has been added 1 pint of 100 volts peroxide and 1 ounce of potassium iodide per 50 gallons of solution.

INSPECTION

Testing of deposits is carried out by use of the BNF jet test for thickness of the copper and nickel deposit. This test is standardized from time to time by reference to the microscopic method.

Porosity tests are carried out in accordance with the procedure laid down by Lutwak.[1] This test has been found comparable with the salt spray test with the advantage of being much faster.

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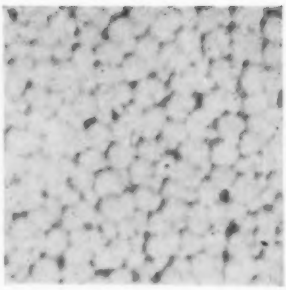
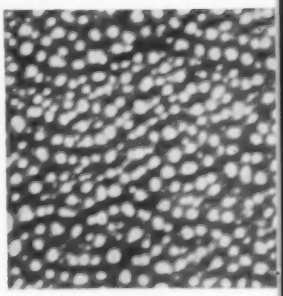
ACKNOWLEDGEMENTS

To the management of Die Casters Ltd.—for permission to publish this article and to J. J. Dale for his assistance in its preparation.

Kevin W. Howard was born on March 19, 1927 at Melbourne. He received a degree in Metallurgy from the Melbourne Technical College in 1951. Kevin was associated with Diecasters Ltd. from 1948–1955—from 1951–1955 as Metallurgist. He is presently employed by Aviation Electroplating Industries Pty. Ltd. as Technical Officer.

COLORED ANODIC COATINGS ON ALUMINUM†





By HELMER BENGSTON*

In this article are reviewed some of the factors which govern the formation of colored electrolytic oxide coatings on aluminum and its alloys. Considered, in turn, are the properties of the oxide coating, effect of alloying elements, coloring materials, and the finishing procedure.

The first reference to colored anodic coatings on aluminum dates back to the early twenties, but the oxide coatings then associated with coloring were not very desirable.

It's of interest to note that one of the leaders of the aluminum industry in 1930 did not recognize the finish represented by some samples of dyed, anodically coated aluminum, but assumed them to be coated with an organic enamel.

Today, colored anodic coatings are being applied to exterior, architectural, building panels, and the finishes are expected to be durable. Less successful was the first architectural application in the early thirties. Fortunately, this was a very modest beginning—shingles for a private dwelling. They were a beautiful green in the Spring and, like the leaves, turned brown in the Fall.

To understand the procedure for producing colored anodic coatings on aluminum, it is well to study briefly the nature of the oxide coating and how its properties affect the operations involved.

The anodic coating is primarily aluminum oxide, but it contains small amounts of SO_3 if formed in sulfuric acid, or traces of constituents of whatever electrolyte was used. Also, there may be present oxides of alloying elements. The oxide coating reproduces the surface condition of the metal. It is smooth or rough depending upon what was done to the metal surface.

Development of the oxide takes place at the metal-oxide interface. The outside surface of the oxide film was the first to form, and therefore subjected to any chemical action by the electrolyte for the longest time. That portion of the oxide coating is therefore less hard than interior portions of the coating.

Since growth takes place at the interface, the coating must necessarily be porous. The pore structure has been revealed by the electron microscope. It is similar to a honeycomb in structure. The pores are perpendicular to the metal surface. It is believed that color is produced by absorption of dye upon the walls of these pores, or by deposition of pigments within the pores. The nature of the coloring materials that can be used depends upon the size of these pores. How small they are is indicated by the fact that one square inch of surface has 500 billion pores. Furthermore, the pores occupy only 10 per cent of the oxide coating volume. The pore diameter tapers only slightly toward the metal interface.

Dye suppliers have stated that the dye solutions used are true solutions—not colloidal. Study has revealed, however, that not all dyes are absorbed to the same depth into the pores of the coating. With none of the dyes tested did the color extend through the entire coating thickness. A natural assumption is that the depth to which a dye can penetrate is determined by a physical limitation of size—size of the molecule or aggregates of molecules.

Dispersible pigments that have the appearance of true solutions cannot enter the pores of the coating. India ink, a form of colloidal carbon, cannot enter the coating.

The dyed coatings are durable with respect to wear. That property is a function of the hardness of the oxide coating. The interior portion of the normal anodic coating is harder than glass, for it will cut glass. Polishers know how hard the coating is after having tried to remove traces of oxide coating remaining on incompletely stripped work.

The absorptive capacity of the oxide coating is demonstrated by touching a moistened finger to the surface of a dry freshly formed coating. It feels tacky. After the coating has been properly sealed, it does not exhibit that effect.

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* Chief Chemist, Stolle Mfg. Co.

† As presented before the AES Tri-State Regional Meeting, Dayton, O., 5-10-56.

COLORING MATERIALS

The first coloring materials used by the author were package dyes from a drug store. Later they were obtained through dye manufacturers. The suppliers were unable to help much in the selection of dyes, so the problem became to find proper dyes by trial and error.

Today, some dye companies have worked on the problem and have provided pattern books showing swatches of dyed anodically coated aluminum, but there is little information about the properties of the colors produced with the available dyes. Even today there are very few colors that have sufficient resistance to weathering to permit exterior service.

Most of the applications of dyed coatings are in interior service, and do not require much resistance to fading. Tests have shown that colored coatings show little fading unless directly exposed to the rays of the sun. Diffused sunlight has little effect upon the dyed finishes.

The increased consumption of dyes for coloring anodic coatings has finally created interest among more of the dye manufacturers. Eventually, there may be available a series of dyes that will be stable and suitable for exterior service.

The dyes normally used for anodic coatings are of the acid type—the type used in wool dyeing. They are used in slightly acid solutions. Strongly acid or strongly alkaline dyes cannot be used, for the oxide coating is attacked outside the range of approximately pH 4 to pH 9. This limitation has so far prevented the use of vat dyes, which are quite resistant to fading, but which must be applied in highly alkaline solutions.

There is a need for a series of primary color dyes which can be used in any combination. Each member of such a series would be absorbed in proportion to its concentration in the dye solution. Two such dyes, yellow and blue for example, could be mixed in a series of solutions ranging in concentration from 0 per cent yellow and 100 per cent blue to 100 per cent yellow and 0 per cent blue. That series of solutions should then produce colors ranging from a pure blue, and with increasing amounts of yellow pass through a graduated series of colors—yellowish blues, greens, bluish yellows to pure yellow.

Generally, it is found that in a mixture of two dyes, one dye is more readily absorbed than the other, and it becomes necessary to use a mixture in which the less readily absorbed dye is present in an abnormally high percentage of the dye content of the solution.

However, difficulties do not end with the establishment of such a proportionality. Too often it is found that the color obtained is inconsistent. The reason is that the mixture selected was based upon one set of anodic coating conditions. A variation in one of a number of factors will change the relative absorption rates of the dyes so the green, for example, will range to the yellowish side or to the bluish side.

Those who have worked with manufactured dye mixtures will know that a color that matches the dye maker's color pattern is not always obtained. When that happens it is because the same set of anodic coating conditions that the manufacturer used were not employed.

Factors other than anodic coating conditions can mar the anticipated results. The ideal dye would stay in place after being absorbed by the oxide coating, but that does not happen 100 per cent of the time. Instead, it is necessary to fix the dye within the oxide coating. Before fixing can be accomplished some dyes will leech out in the rinse water. Additional dye will be lost in the sealer before fixing is complete. Furthermore, when a mixed dye has been used, the one component may bleed more than the other. Result—a variation in hue.

Because of the difficulties outlined, it is most desirable to use a single component dye. Frequently, the customer's desires cannot be met that way and we must resort to two and three component dye mixtures. We always try for approval of a working range of color—the wider the better. A range is necessary for single component dyes as well, for allowance must be made for anodic coating variations.

The dye manufacturer also has problems. The percentage recovery in dye manufacture is not 100 per cent, and the percentage yield varies. Consequently, the manufacturer will cut his batches with a filler, which may be a salt, so that his product will have a fixed color content per pound. The filler may have a pronounced effect upon the absorption properties of the dye, insofar as its use for anodic coatings is concerned. There have been instances where the filler was absorbed in preference to the dye, thus preventing penetration of the dye into the coating.

A case is known where the concentration of the added filler in the dye solution gradually decreases through absorption by anodically coated work and, as a result, the dye bath speeds up to the point that some of the filler compound must be added to slow up the dyeing rate.

Because of these filler effects, there is a tendency toward the use of higher dry dye concentrations. An alternate solution of the problem is to use fillers that do not affect the absorption properties of the oxide coating.

Another class of coloring materials used for anodic oxide coatings are the mineral pigments. The pores of the oxide coating cannot absorb mineral pigments as such, but they will admit solutions that can produce mineral pigments. Pigments must be formed within the pores of the oxide. One pigment in use today results from the hydrolysis of a salt in solution. The gold or brown color used in architectural applications is formed in that manner.

A pigment color, used in the past, is cobalt sulfide. It is formed by absorbing successively cobalt acetate, and ammonium acid sulfide. Cobalt sulfide produces a beautiful black color, but today it has been replaced by certain black dyes which are considered superior.

Other pigment colors can be produced but they have not been used commercially to any extent, for it is difficult to obtain uniformity.

The sealing treatment, which usually follows coloring with either dyes or mineral pigments, has a pronounced effect upon certain dyes, particularly when metal salts are used. It is assumed that when sealing increases the resistance of the color to fading, a metal dye compound has been formed. Sometimes the color is changed upon sealing in nickel acetate—a further indication that an initial com-

pound of the dye has formed. This is analagous to lake formation in textile dyeing.

A variety of color effects can be obtained with dyes. Multicolor effects can be obtained by applying first one color, masking a portion of the dyed surface, bleaching the color remaining exposed, and re-dyeing the exposed surface with a second color. By the same general procedure, one portion of a surface can be finished in color, and the remaining surface be uncolored.

Additional decorative effects can be obtained by combining the dyed anodic finish with white or colored baking enamels.

Multicolor name plates have been made by using a double anodic treatment procedure. The sheet is anodically coated and dyed in one color, and a design is applied by off-set printing upon the sheet surface—the printing serving as a mask. The exposed oxide coating is removed by etching, and the sheet is again anodized and dyed with a second color. Three or more color jobs can be similarly produced.

It is possible to obtain printing inks containing dyes suitable for coloring anodic coatings. These inks are printed upon aluminum sheets or articles which have first been anodically coated. Multiple printing can produce beautiful effects.

Other color effects can be obtained by suitably texturing the aluminum surface before anodic treatment. Patterns are thereby produced due to variations in reflectivity of the surface.

ALLOYS

It has been stated before that the anodic coating is primarily aluminum oxide. That is particularly true when the base metal is pure aluminum. In that case the oxide is glass-like and highly transparent. When dyed, coatings on pure aluminum have a very metallic appearance, for light reflects from the metal surface in the same manner as it does when a clear lacquer is applied over such a surface.

Dyed oxide coatings can vary in appearance from the metallic looking coatings to coatings as opaque as a pigmented paint. These variations are the result of certain elements used in producing aluminum alloys.

An alloying element present in solid solution has little effect upon the transparency of the oxide coating, but when elements are present in amounts in excess of their solid solution solubility, they will affect the properties of the oxide coating. If the element is dissolved by the electrolyte it renders the oxide coating more porous. If the element oxidizes and the oxide remains in the coating, it will render the coating less transparent and, in some cases, impart some color to the coating. Copper usually dissolves, manganese may produce a brownish cast and chromium may impart a yellowish cast.

Silicon is only slightly soluble in aluminum. Excess silicon remains unoxidized in the coating and imparts a greyish color. In large amounts silicon renders the coating opaque.

Regardless of the alloying elements present, the anodically coated alloy can be dyed though the results may not always be desirable. Copper bearing alloys dye more readily because of the more porous coating. If the alloying elements cause reduced transparency of the oxide coating, the addition of dye results in a less brilliant color.

THE ANODIC COATING PROCEDURE IN RELATION TO DYED COATINGS

Surface Preparation

Since the surface layer of metal becomes part of the anodic coating, the condition of that surface layer is very important. If the item has been fabricated from rolled sheet, the metal surface will probably have aluminum oxide inclusions along with other impurities. If that surface is merely prepared by degreasing or cleaning with a non-etching alkaline cleaner, the anodic coating will contain all of those inclusions, and the dyed coating will be irregular in color and will lack the luster that would be expected. Usually, therefore, some step other than cleaning is utilized in preparing a surface for color anodizing.

For high-quality work, the aluminum surface is buffed. Buffing causes flow of the metal surface layer and simultaneously works some of the buffing abrasive into the flowed metal layer. In plating circles, this phenomenon is referred to as the Bielby layer. Since the anodic treatment does not eliminate the flowed layer of metal, that layer must be removed, or the dyed finish will not truly represent the metal surface. If the luster is to be maintained, the article is either electrochemically or chemically brightened. At times luster may not be required; but, if uniformity is desired, the disturbed surface layer must still be removed. That can be accomplished with an alkaline etch. The amount of etching required depends upon the depth of the disturbed layer and it in turn is a function of the buffing pressure.

Sufaces are sometimes sandblasted or vapor blasted. These treatments also contaminate the surface metal layer; and, if the contaminated layer is not removed, the dyed anodic coating will be dark and blotchy. Again, electrobrightening or alkaline etching is used to remove the disturbed layer.

If a surface is partly buffed and partly sandblasted, one of the above-mentioned treatments will take care of both surface conditions.

Other mechanical surfacing treatments also cause contamination, but the same remedies can be applied.

THE ELECTROLYTE

Various electrolytes can be used in color anodizing work, and the results vary. The commonly used electrolytes are sulfuric acid, chromic acid, and oxalic acid—listed in order of importance to use. Sulfuric acid is primarily used, for its coatings are most transparent, and, of secondary significance, it is most efficient.

Chromic acid electrolytes are used in aircraft application for producing protective oxide coatings, and it can also be used for decorative coatings. Depending upon electrolyte composition, it can produce either transparent coatings, or what appear to be, translucent to opaque coatings. This latter type coating is of most interest, for it is attractively different from coatings formed in sulfuric acid.

An alloy which normally forms a highly transparent oxide in sulfuric acid will produce, under the preferred conditions, coatings which appear to be almost opaque and enamel-like. These coatings will dye to form pastel colors.

Oxalic acid, alone, is not used as a commercial electrolyte in the United States. It has been a favorite electrolyte in Japan, and has been used to some extent in Europe.* The oxide coatings are normally less transparent and are a bit darker in color than sulfuric acid coatings.

The following comments concerning the operation of the electrolyte in relation to the formation of oxide coatings for dyeing, apply to the sulfuric acid electrolyte, but in general these remarks can likewise be applied to the other electrolytes. The conditions are not the same but the trends are the same.

The electrolyte control factors that determine how much dye an anodic coating can absorb are: concentration, temperature, current density and time. Sulfuric acid can be used in concentrations ranging from approximately 5 per cent to 70 per cent. Most electrolytes lie in the range 15 per cent–25 per cent.

Other factors being constant, the rate of dye absorption within the restricted range, increases with concentration. Also, as concentration increases, the coatings become softer and less abrasion resistant. These effects are due to the increased chemical activity of solutions of higher concentration.

Increased electrolyte temperature produces softer, more porous and more readily dyed oxide coatings. These effects are likewise related to increased chemical activity.

Increased current density produces heavier oxide coatings, and the coatings tend to have smaller pore size. These two effects oppose each other in their influence upon dye absorption.

Under normal operating conditions coating thickness is directly proportional to time. Longer time coatings will absorb more dye.

RINSING AFTER ANODIC TREATMENT

It is desirable to remove as much as possible of the electrolyte from the oxide coating before dyeing. Neutralizing dips are sometimes desirable, such as ammonia solution or a sodium bicarbonate solution. A nitric acid dip between rinsing operations is sometimes desirable. It is believed that nitric acid replaces sulfuric acid in the coating and is more readily removed thereafter by rinsing.

DYEING

Though depth of color is in part determined by the conditions of oxide formation, it can also be controlled in the dyeing operation. The dyeing conditions can be adjusted to produce the same depth of color, though the oxide coatings may range widely in thickness and pore size.

The factors that govern the depth of color produced with a given dye are: concentration, pH, temperature and time.

Dye concentration may range from a fraction of a gram per liter to several grams. Increased concentration speeds up the rate of dye absorption. It may be desirable to produce a light color with a heavy oxide coating. In that case it is preferred to use a low dye concentration rather than an extremely short dye immersion.

Black dyes are not true black. They are generally deep blue or purple. The black effect is obtained by absorbing a large amount of dye, and to facilitate that, a high concentration is used.

It was mentioned earlier that dyes can only be used in a limited range of pH. The best operating pH varies among the dyes. Usually, they are used at about pH 6.0. If it becomes necessary to increase the rate of absorption, it can usually be done by lowering the pH. pH 4.5 is about the low limit. There is danger of attack upon the oxide coating at that pH.

For dye mixtures, a decrease in pH might alter the color hue. In that case, one of the other factors could possibly be altered to effect deeper color or an increased rate of absorption.

An increase in temperature of the dye solution speeds up the rate of dye absorption. Such a change may also alter the hue of the color.

Dye absorption increases with time. For room temperature application, absorption has been known to continue for as much as thirty minutes. An adjustment of dyeing time can often compensate for an irregularity in anodic coating control.

RINSING AFTER DYEING

Dye adhering to the surface is removed in rinsing. Some dyes, not strongly absorbed, may be partly leeched out in rinsing. That is true of one dye which after sealing is very stable in exterior exposure. Actually, the rinsing time can be very short so as to minimize leeching.

SEALING

The sealing step is most important in the coloring procedure. Sealing prevents further absorption of dye, or other staining material. A hot solution of a metal salt is normally used—usually nickel acetate. It is believed that the metal salt hydrolizes within the pores of the oxide coating and effectively plugs them with a hydrate.

The sealing treatment is normally followed with water rinsing and drying.

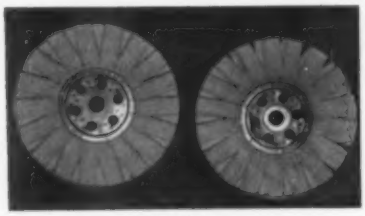
Decorative oxide coatings are sometimes buffed or waxed to increase the luster of the finish.

Helmer Bengston was born in Ashtabula Harbor, Ohio, in 1898. Received BA degree at Augustana College, Rock Island, Illinois, in 1921; MSc, University of Illinois, 1925. Has been working in plating and anodizing since 1926 with The Chromilite Corp.; Aluminum Colors, Inc.; Aluminum Company of America and the Stolle Corporation.

Bengston holds a number of patents connected with the anodic finishing of aluminum. He has devoted the past 25 years primarily to anodic finishing.

* The author has worked with it experimentally and has found that its oxide coating can be dyed readily.

Equipment and Supplies

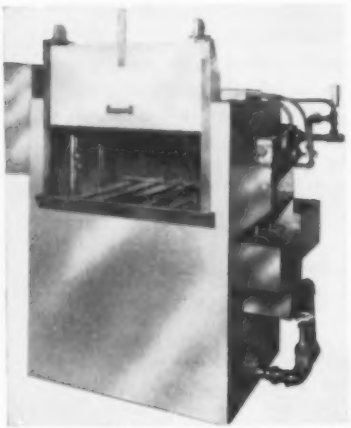


Cut-Color

E—720. Buffs—Fast, thorough cutting and coloring of intricate contoured metal surfaces is provided by a new line of cloth and sisal buffs, according to an announcement from Hanson-Van Winkle-Munning Co.

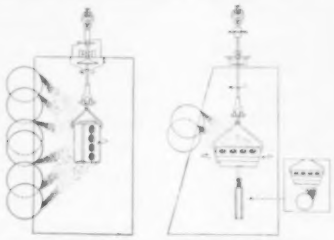
Cloth and sisal "Sisal-Flex" buffs and cloth "Tufta-Flex" buffs can be used in a wide range of heavy and medium metal-finishing processes. The buffs will cut and color metal in a single operation, due to their design and materials of construction.

E—721. Cleaning Machine—Developed for cleaning small parts, this compact automatic cabinet type cleaning machine is widely adaptable for washing, rinsing and drying in all metal working fields according to the manufacturers, Ransohoff, Inc. Both small and large plants can use this machine either as a single unit installed in one or more locations or in a group of 2, 3, 4 and more installed in one location as required.



All Purpose Cleaner

Savings in valuable floor space are effected since it occupies only 10 square feet. Savings in cleaning time are possible where still tanks, manual cleaning operations or inefficient equipment are replaced by this machine which can process up to 40 baskets of parts per hour. Similar savings in labor are possible since one man can operate a single machine in conjunction with another job or a group of machines as one job replacing a crew of men.

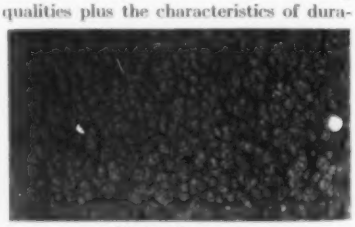


Conventional design New UB design

E—722. Monorail Blast Cleaner—Wheelabrator Corporation, Mishawaka, Ind., announces its new UB Wheelabrator monorail-type blast cleaner. This machine is intended for handling cleaning problems involving parts with internal open cavities that are difficult to clean completely. A typical application is the cleaning of cast automotive engine blocks. Another is the etching cleaning of welded water heater tank shells before glass lining or porcelain enameling.

The new machine, an airless abrasive blast cleaner, differs from older and conventional designs in that more efficient use is made of the blast cleaning abrasive. This results in less abrasive use. Fewer centrifugal abrasive-hurling units are required, so power costs are reduced. The total result is lower cleaning cost per part.

E—723. Hammered Finish—A new hammered finish that has excellent hiding qualities plus the characteristics of durability, resistance to chemicals, wear and weather of regular "Poly-Ep" Platon has recently been introduced by Minnesota Platon Corporation, Pipestone, Minn.



Highly Resistant

"Poly-Ep" Platon is said to produce a finish that is highly resistant to cracking, chipping or peeling under impact; exceeds Federal paint specifications for rust inhibitive enamel from 200 per cent to 400 per cent; is unaffected by all common household chemicals, greases, acids and alkalis, urine, etc., and has excellent dielectric properties. It is a two component material, mixed in equal parts as needed, with a pot life of 8 hours or more.

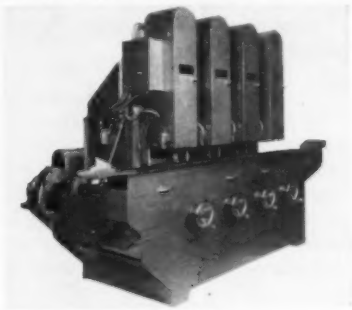
The hammered finish may be applied to any metal surface by spray. It air dries dust free in 30 minutes, may be handled in 6 or 8 hours or it may be completely cured at temperatures up to 350° F in as little as 6 minutes.

E—724. Small PG Wheels—A new line of small "PG" wheels—designed for polishing metal with portable hand tools—has been announced by 3M. The wheels, which have the same basic design as the company's large polishing and grinding wheels, are composed of die-cut pieces of coated abrasive cloth, bonded with resin and locked into a hub.

Lil Wheel

Small "PG" wheels are especially suited for polishing soft metals such as lead and solder because the coated abrasive cannot become filled. The mineral grains and the backing wear away together, presenting an always-new surface to the work. This action assures a constant polishing pattern, since mineral grains never become dull; and the rate of cut is constant through the life of the wheel.

E—725. Conveyor-Type Belt Grinder—This new contact-wheel abrasive belt machine, permitting four simultaneous grinding operations, is manufactured by the Engelberg Huller Company, Syracuse, N. Y. Designed for high-volume flat surfacing of ferrous and non-ferrous metals, glass, plastics, ceramics and other materials, the four-head Model 680-4 belt grinder produces extremely fine micro-inch finishes to exacting tolerances, and makes possible a single-cycle operation from rough casting to polished part.



Four in One

Typical multiple grinding sequence, using a series of progressively finer belts is: rough grind, two semi-finishes, and finish grind. One pass under the four heads can remove an approximate maximum of 0.020-inches of steel stock, and up to 0.060-inches for other materials and applications.

The Model 680-4 is applicable to both wet- and dry-belt grinding. Approximate capacity of cooling unit, equipped with ½ hp coolant pump, is 100 gallons.

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★ **Soak Cleaners.** Complete line for the electroplating, vitreous enameling, and painting industries: W.L.G.,* ALTREX,* NO. 11 CLEANER, RUVAT.

★ **Barrel-Finishing Compounds.** De-burring and burnishing types for steel, stainless steel, brass, zinc die castings, aluminum, and copper.

★ **Washing-Machine Cleaners.** Alkaline and emulsion types, for spray and rotary machines: EXPRAY-AP, INDUSTRIAL 38, NORDALL,* EMLON.*

★ **Paint Removers.** Alkaline and solvent types, for all finishes on all metals.

★ **Paint-Preparation Products.** Cleaning and phosphating processes: PRE-FOS,* PHOS-IT.*

★ **Paint-Department Maintenance.** Water-wash compounds, dry-wall compounds, booth-cleanout compounds.

★ **Rust and Scale Removers.**

★ **Aluminum-Specialty Products.** Etchants, de-smutting compounds, preparation for spot welding, brighteners.

★ **Rust Preventatives.** R-2, NORDALL.*

★ **Neutralizers.** For pickling and vitreous-enameling lines.

*Reg. U.S. Pat. Off.

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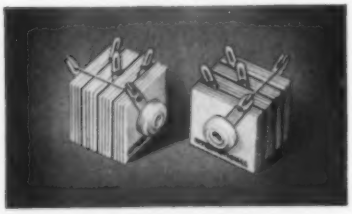
EQUIPMENT & SUPPLIES



Single-Phase, Full-Wave

E—726. Selenium Rectifiers—To fill the need for additional small, compact and inexpensive selenium rectifiers for operating magnetic devices, International Rectifier Corporation has developed type 61-2020, a single-phase, full-wave bridge rectifier. This unit is designed to deliver 90 volts dc at 175 ma for an rms voltage input of 130 volts maximum.

The rectifier occupies only 1 in x 1⅛ in x 1¼ in overall volume and can be mounted with a No. 8 (.164 in) machine screw, through the hollow brass eyelet.

Type 61-2020 combined with types D-3575 F and 60-9150 gives the electronic design engineer a wider range of single-phase, full-wave bridge rectifiers with output voltages of 90 volts to 180 volts dc at currents of 100 ma to 175 ma.

E—727. Cr Plating—A highly concentrated, liquid product, Super Power No-Cro-Mist, is announced by R. O. Hull & Company, Inc. for the most economical and complete suppression of chromium plating fumes to safeguard workers' health, minimize plating rejects, chromic acid consumption, and maintenance of equipment. Its physical effect in pronouncedly lowering the bath surface tension markedly improves covering power, and often as much as 20 per cent lower total current may be used.

Unloader

E—728. Variable Speed Barrel—Mido Products, Inc., Calif. offers a built-in unloading chute in the Mastercraft variable speed barrel finishing machine which minimizes the handling of small parts or small lots in deburring or burnishing operations. Work pieces, abrasive media, water, and compound unload from the barrel opening down the chute, directly on to the separating screens, where the parts remain. Media can be reloaded into the barrel from the receiving pan.

E—729. Recovery of Chromic Acid Solutions—A patented method for recovering contaminated or spent chromic acid solutions typical of chromium plating, anodizing and copper stripping operations has been developed by the Mutual Chemical Division of Allied Chemical & Dye Corporation, and is being made generally available for industrial use without the requirement of any formal license. U. S. Patent No. 2,733,204 was recently issued covering this method.

The process involves ion exchange treatment for removal of metallic contaminants of iron, copper, aluminum and other metals by passing solutions through a cation exchange resin consisting of a sulfonated infusible polymerizate of a polyvinyl aryl compound. Such treatment on a hydrogen cycle permits recovery of baths which become inoperable due to excessive metallic contamination or reduction in acidity.

E—730. Buffs—Bison Corporation of Canton, Ohio announce the manufacturing of the new air cooled metal center buffs with either permanent or removable centers.

Bison buffs, which are made in all sizes and densities, are fully ventilated and guaranteed against burning due to their exclusive use of a specially treated and finished cloth.

It is claimed that these buffs will not fray or ravel, will last 15 per cent to 30 per cent longer than any other buff of the same type, are perfectly balanced, cooler running, individually tested and sewed around the steel center as an extra safety measure.

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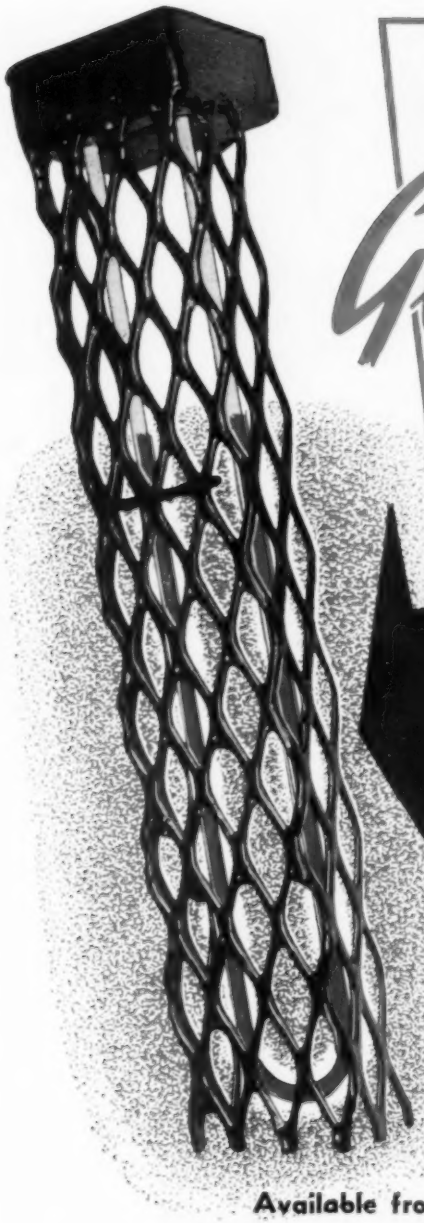

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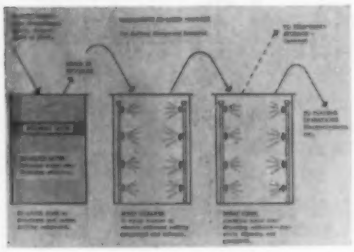


E—731. Precleaning Process—A new process which has been field tested for more than 12 months for precleaning of buffed zinc die castings and other metals, preparatory to plating, has been announced by Wyandotte Chemicals Corporation. A patent has been applied for on the key product of this group—Mersoclean-540.

Field testing by automotive, job plating and plumbing ware shops has shown that the new Wyandotte process practically eliminates fire hazards (flash point of the key product is above 210° F), handswabbing, obnoxious odors and yet gives improved cleaning. In a plant doing a heavy volume of die cast plating, rejects with the Wyandotte process were practically eliminated and cleaning costs reduced as well.

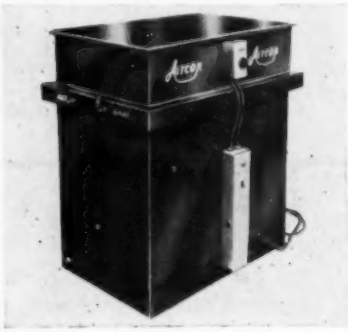
The new Wyandotte process (Mersoclean-540, Expray-541 and Wyandotte 608) employs bi-layer soak cleaning followed by spray washing for complete removal of all buffing and polishing compounds including those baked on by high temperatures from all common metals prior to plating.

Small Trap

E—732. Thermodynamic Steam Trap—Now the revolutionary new Sarco Thermodynamic TD steam trap (patent pending) is available in the $\frac{3}{8}$ in size as well as the $\frac{1}{2}$, $\frac{3}{4}$ and 1 in sizes.

Slightly larger than a 50-cent coin, the $\frac{3}{8}$ in size is well-suited for applications such as tracer lines. Withstands waterhammer and corrosive condensate. Operates equally well on light or heavy loads and against back pressures up to 50 per cent of inlet pressure. Closes tight on no load. Same trap without changes for 10–600 psi. Practically no maintenance required for this new steam trap which has only one operating part, a solid, hardened stainless steel disc.

E—733. Vapor Degreaser—A new model vapor degreaser has been added to the Aircon line of vapor degreasers manufactured by Armstrong & White. Known as the Aircon Model 75, it is suitable for both large and small plants where an economical, permanent installation is desired for continual operation or as needed. This unit fills the gap between smaller, portable vapor degreasers and the larger, higher capacity degreasers.



Medium Size

A working area of 24 x 40 x 24 in, combined with a fast cleaning cycle, permits a load capacity in excess of 750 pounds of steel per hour. Solvent requirement—16 gallons, boiling sump—24 gallons storage. Suitable for either trichlorethylene or perchlorethylene solvents.

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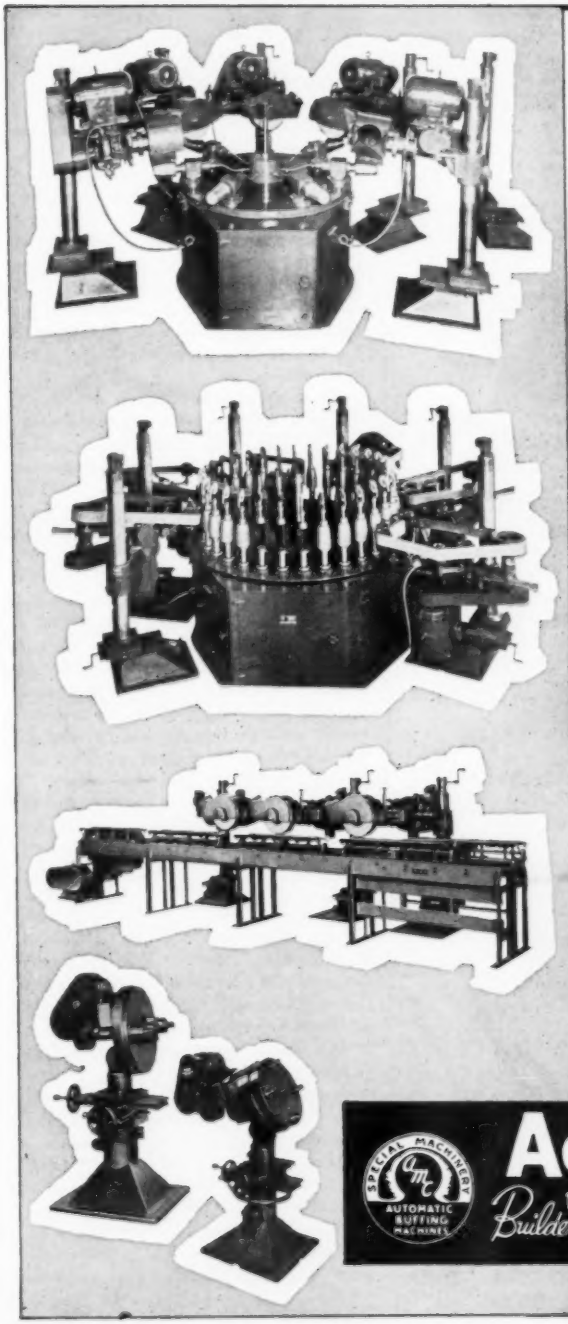

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CATALOGS ON REQUEST

EQUIPMENT & SUPPLIES

E—734. Corrosion-proof Flooring Material—The Ceilcote Company, Inc. announced the development, manufacture and availability of Corocrete A, a new corrosion proof floor material which provides increased protection from attack by alkalis, solvents and acids. Developed for application directly over concrete, the new material is composed of three basic ingredients: a thermosetting resin liquid; a hardening agent and aggregate-type filler.

Developed to meet wide applicational requirements in chemical processing, food processing, plating and metal working industries, the new material is mixed at the job site for immediate application. In most instances where conventional coating membranes will be destroyed by solvents, exposing the concrete base to attack by acids, Corocrete A can be used successfully. The protection provided is greatly superior to that offered with most brick flooring and membrane.

E—735. Fully-Protected Germanium Rectifier—A new line of germanium electroplating rectifiers, fully-protected against circuit overloads, has been developed for the metal finishing industry by Wagner Brothers, Inc., Det.

Utilizing the new General Electric germanium "Safety Cell," hermetically-sealed to protect the germanium wafer from the deteriorating effects of moisture and corrosive fumes, the rectifiers have permanent characteristics—will not age!

Real Safe

Basic stacks consist of six germanium cells, each with cooling fins. The stacks are of a standard design, are interchangeable, and are rated at approximately 500 amperes each.

Every germanium cell is individually protected against circuit fault conditions and sudden overloads by fast-acting "amp trap" fuses which break circuit in a fraction of a second, before irreparable damage can be done to the heat sensitive germanium junction.

All units are forced air cooled, being equipped with an extra-capacity centrifugal blower. The 3-phase blower motor is provided with a separate magnetic starter to guard against overloads. The unit is further protected from the build-up of destructive temperatures due to blower failure by a "pressure switch."

E—736. Chromic Acid—Mutual Chemical Div., Allied Chemical & Dye Corp., N. Y. announce that their new product chromic acid is available as technical flake or powder and is 99.8 per cent pure. The flake is furnished in 50, 100 and 400 pound steel drums, and the powder in 100 and 400 pound steel drums.

E—737. Conversion Coating—Oakite ChromiCoat, a conversion coating for aluminum and zinc designed to meet Specification MIL C-5541, has recently been introduced by Oakite Products, Inc.

The new product is said to impart resistance against corrosion and to improve paint adherence. According to the manufacturers, the ChromiCoat coating, which becomes integral with the treated metal surface, reduces paint chipping and flaking. If the surface should be damaged, the ChromiCoat treatment is said to confine corrosion within the area of the exposed metal—corrosion does not creep under the undamaged paint to cause blistering.

ChromiCoat is used at concentrations of 2 to 3 oz/gal of water at temperatures up to 100° F in either tank or washing machine. It is said to be economical in both initial charge and upkeep, and to require no special application controls. Solutions may be held in stainless steel, or polyethylene or Koroseal-lined steel tanks.

'nough said!

Why not send us an order to cover your next spot need?

BETTER FINISHES & COATINGS, INC.

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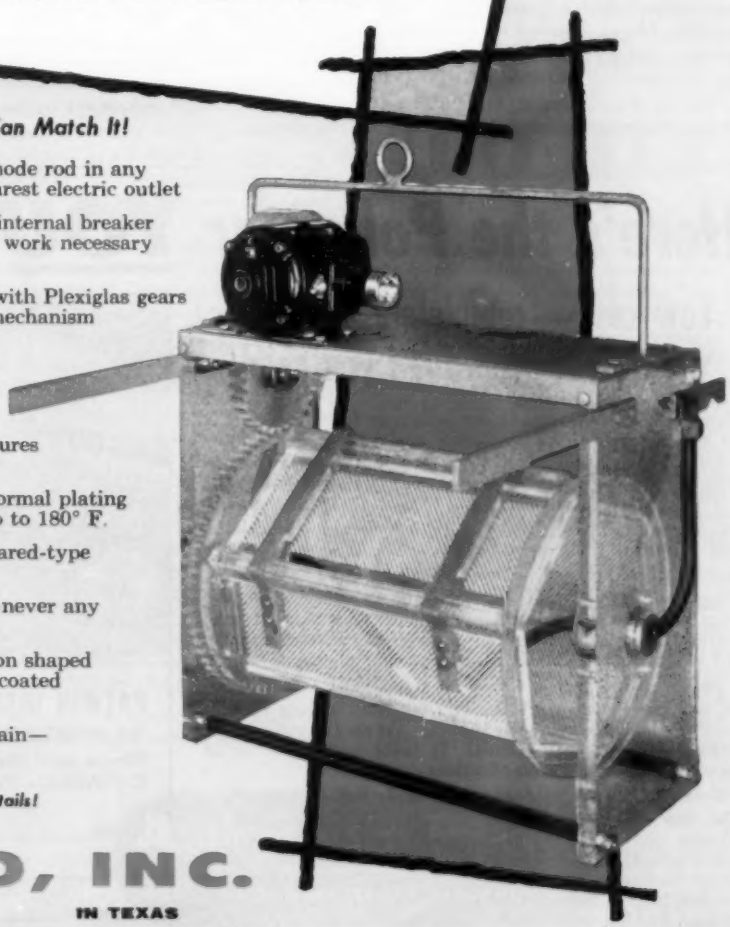
FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 738.

Better, Faster, Lower Cost Plating of Small Lots!

NEW! LASALCO'S Model 9 x 15 Utility BARREL PLATER

with High Temperature Plexiglas Cylinder



No Other Plater At Its Price Can Match It!

- Easy! Just hang it on the cathode rod in any plating tank and plug into nearest electric outlet
- Hexagon shaped cylinder has internal breaker strips to insure interchange of work necessary for more uniform plating
- Positive smooth 3-gear drive with Plexiglas gears eliminates plate-up on drive mechanism
- Dragout loss is cut to a minimum because barrel rotates as it is lifted from solution
- Double flexible connection insures positive contact
- Plexiglas cylinder resists all normal plating solutions and temperatures up to 180° F.
- Rugged, specially designed geared-type motor
- Nothing plates but the load—never any tree-up on cylinder
- Cylinder size 9" x 15". Hexagon shaped with removable door. Plastic-coated spring-type latches
- Easy to clean—easy to maintain—economical to operate

Ask For Complete Details!

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PRospect 1-2990

IN TEXAS
1113 Perry Road, Irving (Dallas), Tex.
BLackburn 3-4921

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 739.

EQUIPMENT & SUPPLIES

E—738—Cold Cleaner—A new low cost cold cleaner developed by Klem Chemicals, Inc., Mich. for spray washers is claimed to offer greater effectiveness as well as simpler operation. It is identified as Klem Kleaner No. 258. It does a thorough job of removing all types of soil including cosmoline type rustproofing compounds. One of the outstanding claims made for it is its rustproofing qualities. Maintaining control of concentration is another advantage of the new product as compared with the guesswork involved with the use of cold cleaners and emulsions. Foaming, which has been a major problem of the present cold cleaners in modern equipment with violent agitation and high pressures, has been controlled with the use of Klem's No. 258.

E—739. Ion-Exchange Unit—Low-cost mineral-free water, equivalent in ionic purity and softness to distilled water, is now available from any water outlet with the new "Perma-Demon" unit manufactured by Enley Products, Inc., Brooklyn, N. Y.

Capable of producing up to 100 gallons of mineral-free water before ion-exchange

material is exhausted, the unit has the lowest initial and operating cost of any water demineralizer of its size and does not require cartridge replacement by the manufacturer.

E—740. Monel Metal Degreasing Basket—A new basket made for use in the degreasing and annealing furnace, is constructed of No. 16 gauge corrosion-resistant Monel metal throughout, according to the Wiretex Manufacturing Company, Inc., Bridgeport, Conn. The basket was recently constructed for use by the American Radiator and Standard Corporation's Plumbing and Heating Div., Phila., Pa.

Monel possesses useful resistance to corrosion by all the common organic acids, and is practically free from corrosion by neutral and alkaline organic compounds. It is one of the toughest of alloys, which is due to the coexistence of high ductility and high strength. There is much to support the claim that Monel possesses a useful degree of resistance toward more corrosives than any other malleable metal.

Here's the Polarizer YOU asked us for!

Low cost — completely portable, yet it does everything you need!

Two years ago we brought out polarizers for electro-platers to use in making rapid, accurate analyses of their plating solutions. As we told you at the time . . .

The C-1 Gave You FULLY ADVANCED Research-Control . . . because we developed it out of our own long experience as contract and production platers, and because test models had been very well received by large plating concerns.

But You Told Us It Gave You Far MORE Than You Needed When we talked to you—the plating men on the firing line—you told us you didn't need expensive additional research features. You needed a small, self-contained instrument to tell you the exact metallic content of your plating solutions.

So Here's the Patwin C-2—Just What YOU Asked For! In two steps you get the answer: take the current reading on the microammeter; read the analysis on the scale in the Patwin "Cook-Book" Manual. It takes only a couple of minutes; there are no complications.

No Connections Needed! It's Entirely Self-Contained! This new Patwin C-2 Polarizer doesn't have to be plugged in! It runs on three 1½-volt Burgess batteries. Its range is: 0-10-20-30-50-100 microamperes full scale. The sensitivity on direct reading is .1 microampere. Case is 14" x 8" x 8", and is finished in gray hammertone finish on steel—bonderized and primed. For full details, send in the coupon today!

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PATWIN INSTRUMENTS Division
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Please send me full information on your new Patwin C-2 Portable Polarizer.

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Facts to consider when you're buying

Chromate Conversion Coatings

for Corrosion Protection, Paint Base, Decorative Finishing

WHAT IS IRIDITE®?

Briefly, Iridite is the tradename for a specialized line of chromate conversion finishes. They are generally applied by dip, some by brush or spray, at or near room temperature, with automatic equipment or manual finishing facilities. During application, a chemical reaction occurs that produces a thin (.00002″ max.) gel-like, complex chromate film of a nonporous nature on the surface of the metal. This film is an integral part of the metal itself, thus cannot flake, chip or peel. No special equipment, exhaust systems or specially trained personnel are required.

If your company is manufacturing or buying parts or complete assemblies made from or plated with any of the more common non-ferrous metals—zinc, cadmium, aluminum, magnesium, copper, brass or bronze—you've probably already run up against the question of finishing these surfaces with a chromate conversion coating. These coatings are used to protect against corrosion, or to provide a base for paint or to provide a decorative finish for sales appeal or shelf life. Since chromate conversion coatings represent a relatively new means of obtaining these finishes, this digest of facts to consider may be of value to you.

1. THE COATINGS THEMSELVES. There are many brands on the market. All are similar in many ways. Each, of course, offers its own specific advantages and these may relate to operating techniques, performance under actual use conditions, cost, availability, etc. Naturally, you'll want to choose a coating that is widely known and accepted under both military and civilian specifications.

2. THE COMPANY BEHIND THE PRODUCT. Is it a reliable, established organization? Does it offer experienced technical service, both from the field-engineering organization as well as the home office and laboratories? The man who sells and services your installation should be thoroughly familiar with not only chromate conversion coatings and their applications, but also with the characteristics and performance of related finishing operations such as precleaning, electroplating, painting, etc. This is most important since all steps of the finishing cycle must be functioning properly for the satisfactory performance of the ultimate finish produced.

3. AVAILABILITY OF THE PRODUCT. Ideally, of course, the material should be readily available to you from nearby warehouses to avoid time loss in long distance shipping and to provide emergency service, should the need arise.

4. COST. Naturally, the initial price of the material is important to you. However, just as you consider ultimate cost when you are buying mechanical equipment, ultimate cost must be considered for these finishing chemicals. So, it will pay you to investigate consumption costs, labor costs and the other factors which go into the determination of ultimate cost. Further, cost alone gives no indication of product performance, so careful attention must be given to the purpose the finish must serve and the value that finish will add to your product.

5. FACILITIES FOR RESEARCH AND DEVELOPMENT. Perhaps the existing types of chromate conversion coatings do not include a compound that will accomplish exactly what you wish. Then, it is important to deal with a supplier who has adequate research and development facilities available to work with you to produce a material to meet your needs. Naturally, such a project is seldom completed overnight. But, with complete cooperation and confidence from both you and your supplier, chances are a satisfactory program can be completed.

These are the concepts of sales and service on which we, Allied Research Products, Incorporated, have developed and marketed the line of Iridite chromate conversion coatings . . . superior product performance, complete sales and technical service, easy product availability, economical cost, extensive research and development facilities. No doubt you are familiar with our line and have seen this trademark—

IRIDITE®

—in our advertising, technical literature or on shipping containers in your plant. Remember this trademark when you're buying or investigating chromate conversion coatings for your company. It's your assurance of quality, economical products from a reliable and established company, skilled sales and technical service from both our home office and a national network of representatives, immediate availability from warehouses in strategic industrial areas and our willingness to work with you to develop new finishes to meet your needs, should the present line fall short.

For complete information on Iridite chromate conversion coatings, write today for your free copy of our technical data file. Or, for immediate advice, call in your Allied Field Engineer. He's listed under "Plating Supplies" in your classified telephone book.

ALLIED RESEARCH PRODUCTS
INCORPORATED
4004-06 E. MONUMENT STREET • BALTIMORE 5, MD.

Manufacturers of Iridite chromate conversion coatings for corrosion resistance, paint systems, final finishing of non-ferrous metals; ARP Plating Brightener & Chemicals. West Coast Licensee—L. H. Butcher Co.

Now...look what you can do with rinse water...and NEW

By adding a mere ¼ to 2% by volume of Oakite **RINSITE**, you work wonders with your final rinse water.

RINSITE keeps a sparkle on your plated and polished work in two ways... (1) by promoting more complete, uniform draining for spot-free dry down; and (2) by leaving an invisible film to protect certain types of plating against rust and discoloration.

Tumbled work, too, will keep its burnished finish when rinsed with Oakite **RINSITE**. Barrel-finished steel parts come out of the rinse water with full lustre and shielded temporarily against rust.

Folder—F9822 tells the complete story. Get your free copy today. Oakite Products Inc., 40 Rector Street, New York 6, N. Y.

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6 volts, 1500 amps . .	$1565.00
12 volts, 1000 amps . .	$1616.00
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NOW EVERY PLATING SHOP can take advantage of the long life and operating savings of germanium with:

1 **THE UNIQUE G-E TRUE HERMETICALLY SEALED GERMANIUM CELL**—that safeguards the germanium from corrosive atmosphere.

2 **THE UNIQUE G-E GERMANIUM PROTECTIVE SYSTEM**—the first protective device designed specially to help safeguard the germanium cell against all types of overloads. Provides an original advance-warning feature to help prevent costly, sudden shutdowns.

3 **GENERAL ELECTRIC EXPERIENCE IN GERMANIUM**—over 13,000 kilowatts (2,000,000 amperes at plating voltages) of germanium rectifiers installed and operating. General Electric Co., Schenectady 5, N. Y. 463-14

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CALL YOUR AUTHORIZED GENERAL ELECTRIC PLATING AGENT TODAY.

M. E. BAKER CO., Cambridge, Mass.
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COMCO, INC., New Haven, Conn.
W. M. FOTHERINGHAM CO., Buffalo, N. Y.
GENERAL ELECTRIC SUPPLY CO., Cleveland, Ohio
FRED GUMM CHEMICAL CO., Kearny, N. J.
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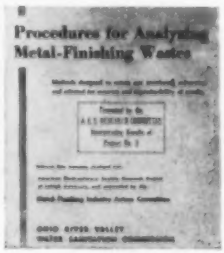

An AES sponsored Research Project is brought together in this soft-bound saddle-stitched booklet. Here are all the results of the study in an easily usable form.

$ .75 to AES members
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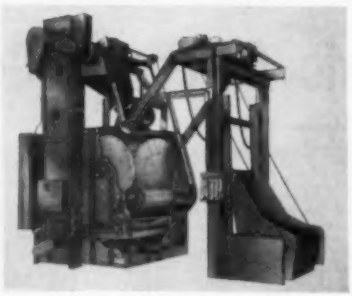
EQUIPMENT & SUPPLIES



E—741. Wheelabrator Super Tumblast—A new batch-type airless abrasive blast cleaning machine designed for improved blast cleaning efficiency and reduced cleaning costs has been introduced by Wheelabrator Corporation, Mishawaka, Indiana. This machine, known as the Wheelabrator Super Tumblast, has an operating load capacity of 28 cubic feet. It is designed for cleaning sand, scale, oxides, and other contaminants from any work that can withstand a tumbling action.

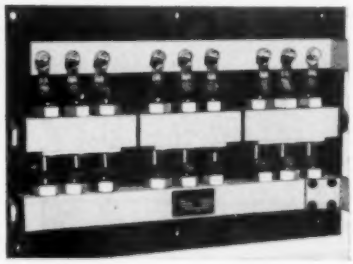
The machine has been engineered throughout for maximum productivity and maintenance-free operation over extended periods of time. Its trouble-free operation lends itself to automated operation. But, whether operated automatically or manually, the Super Tumblast reduces cleaning costs to a new low level and pays for itself through unusual operating economies. The machine has already been subjected to rigorous production and operating tests in various plants.

E—742. Brass Plating—Jelco Finishing Equipment Corp., N. Y., announces that the company is now making available a new brass additive. The new product is to be known as the new, improved Jelco Brass Additive. It can be used in the standard ammonia type of solution or in the new high caustic speed formulations. The additive is used for both still and barrel plating solutions.

E—743. Utility Barrel Plater—Lasalco, Inc., St. Louis, Mo., has announced a new clear plastic utility barrel plater designed for faster, more economical plating of small lots. Designated as Model 9X15, it can be hung on the cathode rod in any plating tank and plugged into the nearest electric outlet.

The hexagon-shaped, high-temperature Plexiglas 9 in x 15 in cylinder resists all normal plating solutions and temperatures up to 180° F. Cylinder has removable door with plastic-coated, spring-type latches.

E—744. Liquid Cooled Germanium Rectifiers—Continuing with the research and development of germanium power products, International Rectifier Corporation has designed a 100 kw liquid cooled germanium power rectifier capable of delivering 80 volts dc at 1350 amperes with a maxmum input of 66 volts dc and approximately 1150 amperes ac and with rectifier efficiencies to 98.4 per cent.



This three-phase full wave bridge rectifier is recommended for ac to dc power conversion where high current at moderate voltage output and small unit size is required. The rectifier design provides for superior cooling using a liquid coolant (water, oil, etc.) at a maximum inlet temperature of 30° C and a flow rate of four gallons per minute (for water). Unlimited operation life can be expected over a temperature range of minus 20° C to plus 50° C maximum where equipment is designed to operate within specified voltage, current and temperature rise ratings.

E—745. Ointment for Skin Protection—Silconex (77 per cent silicone) has been developed by Hygiene Research Inc., as an almost universal skin protective ointment to prevent contact Dermatitis in a large variety of industrial operations. It is the highest in silicone content that has ever been produced and contains only 23 per cent of inert mineral filler. It protects not only against water-dissolved material but also against organic solvents and oil, solvent, water, chemical mixtures. It resists exposure to strong acids, alkalis, oxidizing agents, salts, detergents, antibiotics, protein solutions, allergens and other materials, whether in water or organic solution. It has been extremely effective in protecting against the severe exposure encountered in work with the drilling muds in oil fields.

E—746. Compound for Barrel Deburring—Oakite FM 183, an alkaline material designed for the barrel deburring of small parts, is the newest addition to the line of barrel finishing materials available from Oakite Products, Inc.

It combines a fine, fast-cutting abrasive with surface active agents designed to keep media bright and sharp. Its use, alone or with stones, is said to save time

and cut costs, and in many cases to eliminate individual handling of parts, hand filing and abrasive-belt operations. Used in concentrations of 1 to 5 ounces per gallon of water, Oakite FM 183 is designed for the deburring of stamped or machined parts, grinding off sharp edges, removing tarnish, rust, and heat scale, improving surface finishes, and deburring steel and zinc.

E—747. Nonflammable Solvent—Immunol, a neutral, nontoxic, nonflammable solvent that cleans, degreases and rustproofs all metal surfaces safely and effectively in one operation is being offered by Harry Miller Corp., Philadelphia 40, Pa. The inexpensive product is harmless and can be applied by any method now in common use to clean anything from small parts to heavy machinery. Immunol, mixed with hot or cold tap water, is said to be superior to carbon tetrachloride, trichlorethylene, kerosene, mineral spirits and gasoline and it quickly carries off oils, soils or foreign matter, leaving a protective rustproof coating. Only a few ounces of the solvent per gallon of water are required to produce a gallon of solvent which can be used over again for many applications once the foreign matter has been removed.

E—748. Chrome Cleaner—This new chrome cleaner eliminates all hard scrubbing and rubbing—it literally sponges rust away! Just sprinkle the cleaner on a moist sponge or coarse cloth and wipe the rust away!

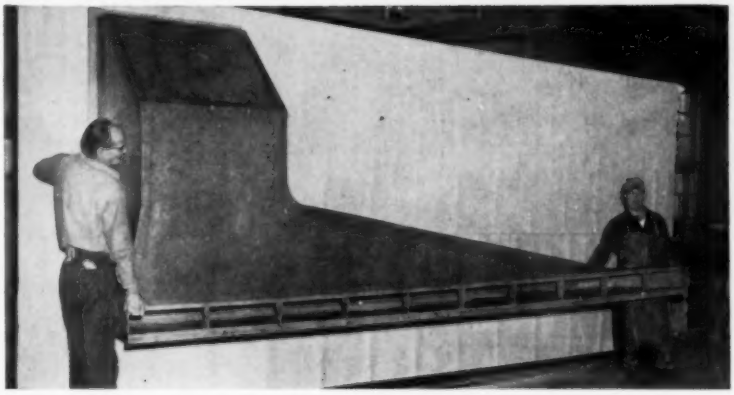
This new product from the Rooto Corp., Detroit, Mich., removes rust and grease from automobile bumpers, and chrome, chrome plumbing fixtures, copper utensils and fixtures, chrome appliances, enameled metal surfaces, stainless steel, metal porch and lawn furniture, sports equipment and other metal equipment, fixtures and appliances.

E—749. Wide Swing Lathe—Responding to numerous requests from various industries for a two-spindle, variable speed buffing and polishing lathe with a wider swing, Hammond Machinery Builders, Inc. of Kalamazoo, Mich., announce availability of their newly designed Model VRROW. According to the manufacturers, this lathe has a swing of 20 inches from side of base to face of inner flange, instead of the usual 12 inch swing of conventional lathes. The two spindles on the new lathe operate independently, each having its own motor and variable speed control. This permits each operator to change wheels or vary speeds without interfering with, or causing down time to the other. Each operator has full 5, 7½ or 10 hp on each wheel. Spindle speeds can be changed instantly while lathe is running by turning the dials.

HAVEG® News

Wherever CORROSION RESISTANCE is a Factor

NEW Corrosion Resistant HAVEG Plastic CUTS EQUIPMENT COSTS



FUME SYSTEMS RESIST WIDE RANGE OF CORROSIVE ATMOSPHERES

Easy low cost installation of Haveg polyester glass fume duct, hoods, fans and fume fittings assure positive removal of corrosive process fumes and gases. Excellent machining and molding properties permit ready fabrication of complete systems or replacement units for deteriorated apparatus in existing ventilator lines, gas distribution systems or similar applications handling corrosive fumes up to 350°F.

Whatever your fume removal problem, there's a Haveg plastic to provide the most efficient and economical system to meet your requirements. Fume stacks and ducts from 6 inches to 12 feet in diameter and over 200 feet high may be flanged for quick assembly in the field—or resin-welded in a single unit! Haveg fume systems require only minimum support, are completely unaffected by the most extreme weather or climate conditions! Discuss your fume removal problems with a Haveg engineer, or write for Bulletin F-7.

LIGHTWEIGHT POLYESTER GLASS TANKS OFFER UNUSUAL ADVANTAGES

Lightweight, low cost fiberglass reinforced polyester plating and process tanks are now available at Haveg Industries' new Pla-Tank manufacturing division. Production of the new tanks augments the complete Haveg line of reinforced plastic tanks for every process application where superior corrosion resistance is required. Production economies of polyester glass tanks and other process equipment permit installation costs considerably below those for conventional lead or rubber-lined, stainless steel—and even mild steel equipment in many instances! Unusual light weight of the plastic tanks provides bonus savings in reduced steel requirements for foundations and supports—easier installation and longer, maintenance-free service.

Haveg 7710 Polyester Glass is strong and tough. Its exceptional resistance to acids, hypochlorites, salts, alkalies, and various oxidizing agents—at process temperatures up to the boiling point assures that maximum strength and durability under the most extreme corrosive acids. Other Haveg plastic equipment provides operating temperatures to 350°F with equal or superior corrosion resistance.

If you plan a new or replacement tank installation, investigate first the outstanding cost and service advantages of Haveg polyester glass and other types of Haveg process equipment. Haveg Bulletin C-13 will give you details of the complete line of Haveg corrosion resistant equipment for process use, Bulletin G-10 describes Haveg polyester glass equipment . . . or ask to have a qualified Haveg corrosion control engineer call without obligation. His recommendations may be the start of major savings.

H-501

HAVEG PLASTICS OF TOMORROW SOLVE YOUR CORROSION PROBLEMS TODAY

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the MURRAY WAY MODEL 10 FILTER

THE AUTOMATIC INDUSTRIAL FILTER THAT RECLAIMS YOUR PRODUCTION DOLLARS

AUTOMATIC—The Murray-Way Model 10 Industrial Filter automatically rotates fresh filtering area into position while simultaneously ejecting the contaminant.

SELF-CLEANING—The permanent filter screen, made in eight sections and screw mounted, is kept clean by the air knife thus giving maximum filtration at all times.

ECONOMICAL—Elimination of costly throw-away media saves you money.

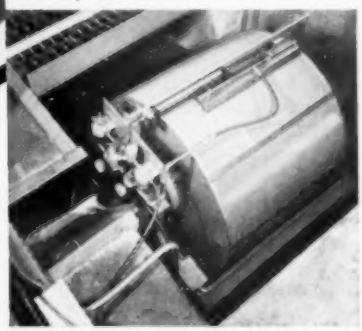
COMPACT—The Murray-Way Model 10 gives you unusually large filtering capacity in proportion to area occupied.

AMAZINGLY ADAPTABLE—The Murray-Way Model 10 Filter may be used as an individual machine unit or as a central filtering station for many units. Capacity may be increased by adding filters in tandem separately or in the same tank.

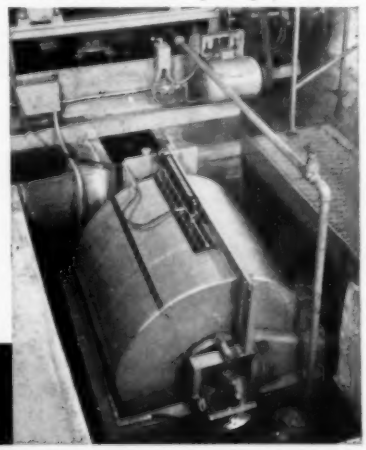
LARGE SCREEN SELECTION—We can supply filtering screen material and size of screen opening in monel, stainless steel, brass or bronze to meet your requirements.

For Complete Technical Details—Write For Bulletin F-5301

Contaminated coolant enters Model 10 directly from source.



Standard Model 10 with 200 mesh screen removing abrasive grindings from 55 viscous coolant oil in belt grinding operation.



MURRAY WAY

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Automatic Polishing, Buffing, Grinding, Filtering Equipment

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PROMAT'S ENTIRELY NEW

Z-B-2

LATEST ADVANCEMENT IN ZINC BRIGHTENING AGENTS!

BRIGHT Even at extremely high current density ranges the effectiveness of Z-B-2 is not lowered. It *stays* bright!

STABLE Z-B-2 is stable in plating solutions of ANY current density . . . . even at extremely high operational temperatures, and during "down" periods!

LIQUID Because it's a liquid, Z-B-2 is easy to handle and requires no special mixing or blending. It is ready to use immediately!

LONG LIFE Replacement schedules will be extended greatly because of the long life of Z-B-2!

BRILLIANT PROMAT'S latest advancement in zinc brighteners gives a beautiful, lasting, decorative finish that cannot be duplicated!

VERSATILE Z-B-2 can be used in still and barrel solutions, semi and fully automatic machines!

COMPATIBLE This great new product of PROMAT'S has been carefully designed to be completely compatible in ALL zinc solutions!

LOW MAINTENANCE COST PROMAT'S research and production team brings you this high-quality new development at very low maintenance cost!

With all these facts in mind, let us show you what this great new product can do for you. Our service engineers stand ready to give you actual proof of how Z-B-2 can serve you. Address your inquiries or write for technical bulletins on this or any of PROMAT'S great Protective Materials products direct to us.

PROMAT DIVISION – POOR AND COMPANY

851 SOUTH MARKET STREET. WAUKEGAN. ILLINOIS P-7

how to keep non-ferrous metals*

from fingerprinting, staining and discoloring

Many non-ferrous metals readily oxidize in the presence of moisture and industrial fumes, or a marine atmosphere. This condition is accentuated by perspiration caused from handling, and materializes in some of the following forms:

(a) Assemblies with fingerprinted components.

(b) Multi-colored parts, caused by variance of processing time.

(c) Handling of merchandise at point of sale.

(d) Poor adhesion of paint and lacquer.

(e) Discoloration and/or spotting out lacquered surfaces.

KENVERT CHROME SEALER processes eliminate these, and many times, buffing and burnishing operations. Their application is very simple, easy and inexpensive.

KENVERT films are widely accepted for toys, interior hardware, electrical components, lamps, venetian blinds, bicycles, store cards, zippers, radios, tools, die castings, skates, refrigerator shelving and a host of others.

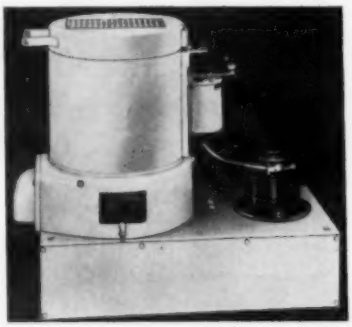
*Zinc, Cadmium, Copper, Brass, Aluminum

CONVERSION CHEMICAL CORPORATION

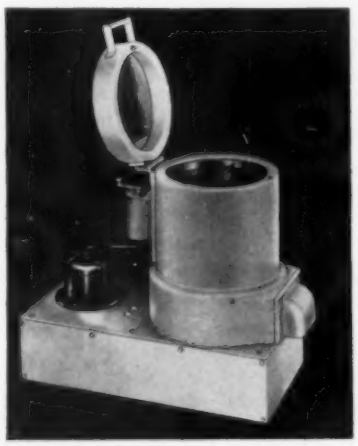
100 E. Main Street, Rockville, Connecticut

EQUIPMENT & SUPPLIES

E—750. Compact Dryer—A new Mercil belt-driven centrifugal dryer features sound engineering, simplicity of design, compactness, economical operation and important safety features, according to an announcement from the manufacturer, Hanson-Van Winkle-Munning Co.



Mounted on a heavy duty base, the new Model 56 dryer is driven by two standard V-belts which are powered by a totally enclosed ball bearing ½ hp vertical flange mounted motor. This design prevents moisture from entering the motor. Dryer basket revolves at approximately 500 rpm. The dryer will handle work loads up to 70 pounds, depending on size and type of work being processed.



The dryer may be electrically heated, with a turntable furnished with a suction fan mounted to draw air down through the work from an opening in the cover, where an electric heating element is located. Heated dryers are furnished with red covers as a safety measure, to warn the user against touching a hot cover. Both heating elements and motor drive are automatically controlled by a heavy duty reversible switch.

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1—8000/4000 AMPERE, 6/12 VOLT, **CHANDEYSSON**, Synch.
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1—5000/2500 AMPERE, 6/12 VOLT, **CHANDEYSSON**, Synchronous, Exciter-in-head.
1—3000/1500 AMPERE, 12/24 VOLT, **CHANDEYSSON**, Exciter-in-head.
1—2500/1250 AMPERE, 9/18 VOLT, **ELECTRIC PRODUCTS**, Synchronous, Exciter-in-head, 25°C.
1—2000/1000 AMPERE, 6/12 VOLT, **HANSON-VAN WINKLE-MUNNING**.
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1—1500/750 AMPERE, 6/12 VOLT, **HANSON-VAN WINKLE-MUNNING**, Synchronous, Exciter-in-head.
1—1500/750 AMPERE, 12/24 VOLT, **CHANDEYSSON**, Synchronous, Exciter-in-head.
1—1000/500 AMPERE, 6/12 VOLT, **ELECTRIC PRODUCTS**.

ANODIZERS

1—1000 AMPERE, 40 VOLT, **CHANDEYSSON**, 25° C.
1—1000 AMPERE, 30 VOLT, **IDEAL**, Exciter-in-head.
1—750 AMPERE, 60 VOLT, **HANSON-VAN WINKLE-MUNNING**, Synchronous, Exciter-in-head.
1—500 AMPERE, 25 VOLT, **CHANDEYSSON**, Synchronous, Exciter-in-head.

RECTIFIERS

1—2000/1000 AMPERE, 6/12 VOLT, **G. E.**, brand new selenium stacks, with "On-load" Automatic Voltage Regulator.
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1—BRAND NEW 2000/1000 AMPERE, 6/12 VOLT, **G.E.** COPPER OXIDE RECTIFIER, with Controls.
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1—TOLLHURST CENTRIFUGAL DRYER, 20" dia. basket, with Steam Heat
1—H-VW-M Full-Automatic Plating Machine, 87' long, 39" lift, was used for copper and nickel.
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1—UDYLITE Semi-automatic Plating-Machine, for cyanide, size 19' long x 48" wide x 36" deep.
1—**HONCI** Enameler, No. R-200.
1—MODEL "A" PRESSURE BLAST.

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- readings are direct
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7 Assorted Anodes
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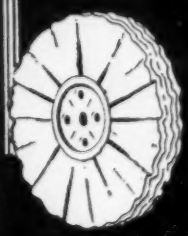

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EQUIPMENT & SUPPLIES

E—751. Wax Dispenser—D. C. Cooper Co., Chicago, Ill. manufacturers of wax and plastic dip tanks, announces the development of a new compound dispensing tank for dispensing waxes, fillers, and insulating compounds.

Cooper's compound dispensing tanks are furnished in any size and with one or more dispensing valves of various sizes to meet all dispensing requirements. The dispensing valves may be operated by hand, foot pedal, or solenoid valve controls for automatic dispensing.

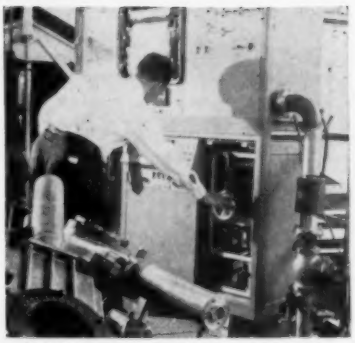
Cooper's compound dispensing tanks are electrically heated, thermostatically controlled and equipped with large dial thermometer for instant checking of temperature.

E—752. Drum Sander—All sizes Cone-Loc Drum Sanders are now available cushioned with neoprene rubber, according to announcement from the manufacturer.

Neoprene rubber is highly resistant to oils, grease, kerosene and other petroleum products frequently used in connection with buffing, grinding or polishing operations. Consequently, Cone-Loc Drum Sanders can now be run in these liquids without swelling or softening effect on the rubber cushioning.

The Cone-Loc Drum Sander is a split drum wheel that makes possible the use of ordinary strips of abrasive torn off abrasive rolls, and eliminates the need for more costly endless belts or clipped end strips.

E—753. Filter Felt—By packing the interstices of a special Orlon woven fabric with short fibers of Orlon, Filtration Fabrics Div. of Filtration Engineers Inc., have developed a new felt with many interesting applications in wet and dry filtration. This new Feon filter felt combines high chemical and temperature resistance with very high bursting strengths . . . plus the fine filtering characteristics of a felt . . . at a cost approximately that of a wool felt. Principal applications will be in filter presses and dust collectors.



Molecular Particles of gases are literally sorted and weighed continuously by this custom-built mass spectrometer, installed recently on the vacuum melting furnace platform at Carboloy Department of General Electric Company, Detroit. Built by Consolidated Electrodynamics Corp., the unit helps determine and control progress of the high-vacuum process by analyzing gases produced in the furnace while special alloys are made

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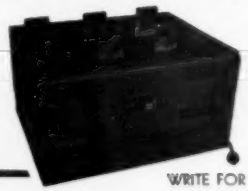

UPA

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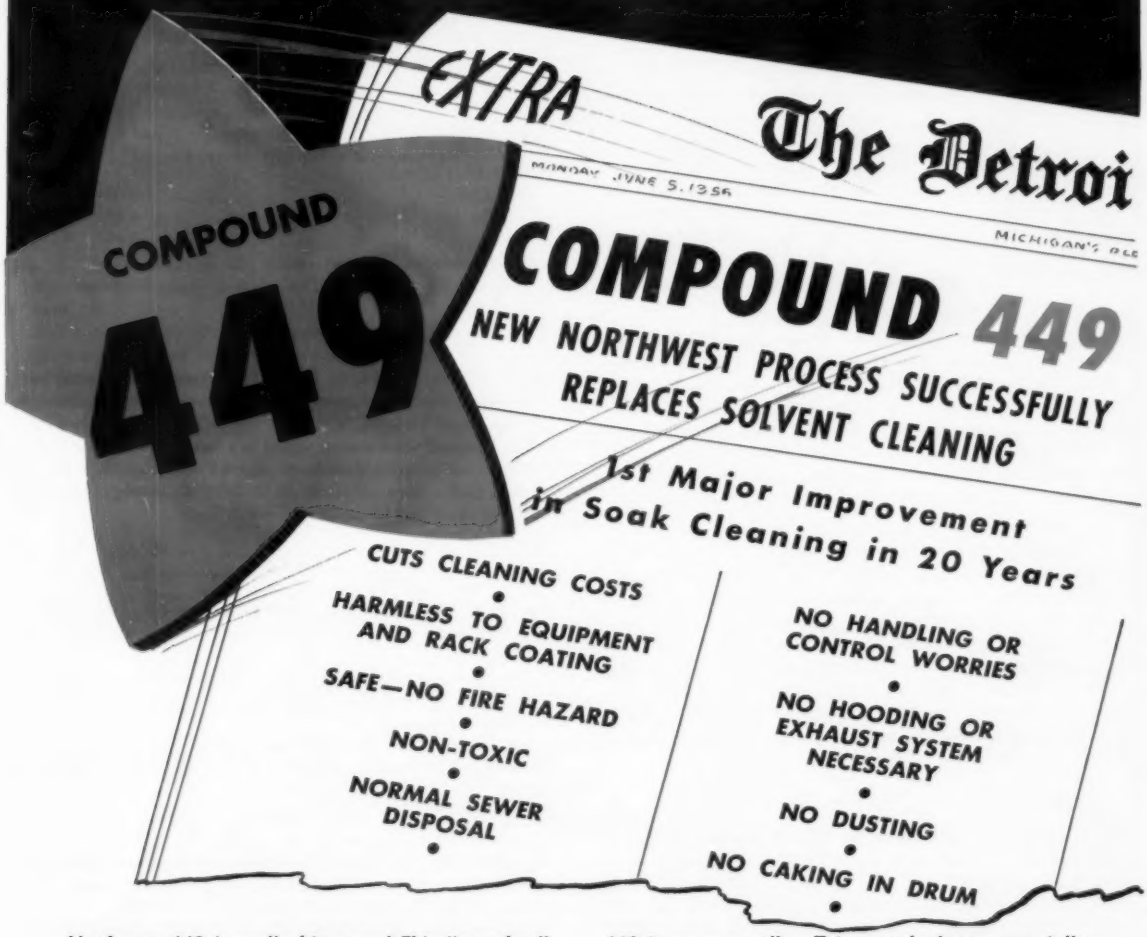


Northwest 449 is really big news! This "complete" new water soluble compound replaces complicated powder and liquid combinations . . . eliminates metal cleaning hazards and disposal problems. It's harmless to rack coating and equipment and makes handling and control simple, easy and SAFE. It will save you time and trouble, and make you money.

449 is an unusually efficient soak cleaner, specially developed for preparing non-ferrous metallic surfaces for plating and finishing operations. 449 has unusually long bath life and wide application range . . . costs no more than ordinary cleaners.

Get our expert analysis of YOUR job by calling or wiring us today.

Remember—the cost per finished piece is the true cost of your cleaner

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 755.

PATENT ABSTRACTS

DR. D. GARDNER FOULKE
Manager, Electrochemical Development
Hanson-Van Winkle-Munning Co.
Matawan, New Jersey

Copies of patents may be obtained by writing to Commissioner of Patents, Washington, D. C. Price 25 cents each.

No. 2,736,441, February 28, 1956—Processing Machine for Electroplating and Like Operations—P. Hauck, assignor to Hanson-Van Winkle-Munning Co., Matawan, N. J.

This invention describes an electroplating conveyor in which the workpieces are automatically transported to separate stations for different processing treatments for various lengths of time. Four figures and the claims explain the mechanism in detail.

9 claims.

—AES—

No. 2,736,640, February 28, 1956—Chemical Polishing Bath—Leslie D. McGraw, assignor to Ford Machinery and Chemical Corp., Columbus, Ohio.

The bath for chemically brightening aluminum contains phosphoric acid and hydrogen peroxide and 1–3 per cent of graphitic carbon. Example 2 describes a bath containing 70 per cent H_3PO_4, 5.3 per cent H_2O_2 and 1 per cent by weight of acetylene black operated at 195° F.

5 claims.

—AES—

No. 2,736,692, February 28, 1956—Electrodeposition of Tin—G. Eckert, assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

The acid tin plating bath is described as an acidic solution of a stannous compound (*p*H of 2–5) containing 2–12 mols of alkali metal fluoride per mol of stannous compound and 0.01–1 g/l of manganous nitrate.

10 claims.

—AES—

No. 2,737,465, March 6, 1956—Synthetic Resin Enamel Stripping Compositions—L. Pessel, assignor to Radio Corporation of America, Delaware.

This composition for softening synthetic resin contings consists essentially of 30–98 per cent pentanedione-2,4,2—50 per cent of formic acid, formaldehyde or formamide, and up to 68 per cent of water. All percentages are volume.

13 claims.

—AES—

No. 2,737,484, March 6, 1956—Bright Nickel Plating—F. Passal, assignor to United Chromium, Inc., New York, N. Y.

This bright nickel process is described as effective by virtue of the use of 0.001–0.05 g/l of 2 mercapto-benzimidazole, or said compound substituted by a radical having a non-metallic atom directly connected to the mercapto compound, along with a type I sulfo-oxygen compound. Example 2 discloses the use of 5-amino-2-mercapto-benzimidazole and example 4 the 2-carboxymethyl derivative.

13 claims.

No. 2,737,485, March 6, 1956—Electrodeposition of Copper—D. Overcash and R. Parks, assignors to General Motors Corp., Detroit, Mich.

This copper plating solution is described as the conventional cyanide bath to which is added zinc (0.05–0.15 oz/gal), lead (0.0005–0.002 oz/gal), selenium (0.0005–0.002 oz/gal) (0.1–5.0 oz/gal) and a quaternary amine (1.10 ml/l). A typical bath is as follows in oz/gal:

Copper	6
KCN	1.4
Na_2CO_3	at least 12
KOH	6
$PbCO_3$	0.001
SeO_2	0.001
Zinc	0.01
Di-Potassium tartrate	2.5
du Pont No. 1085	8 ml/gal

12 claims.

—AES—

No. 2,737,483, March 6, 1956—Tin Plating Bunched and Braided Wire—F. Lowenheim, assignor to Metal & Thermit Corp., New York, N. Y.

The bunched wires can be plated in a bath containing 0.25–3.0 mols/liter of potassium stannate and 0.15–3.5 mols/liter of potassium hydroxide at 30–1000 asf at 50° C to boiling. The wire is rinsed, dried and heated to reflow.

6 claims.

—AES—

No. 2,737,487, March 6, 1956—Electroyltic Apparatus—V. Rayburn, assignor to Western Electric Co., Inc., New York, N. Y.

The invention describes an improved wire-plating apparatus, especially a method for distributing the electrolyte uniformly.

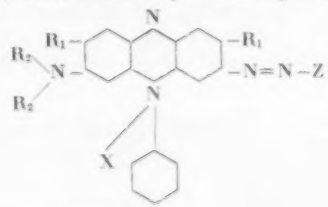
5 claims, 6 figures.

See also No. 2,737,488 describing another wire plating apparatus assigned to Western Electric Co., by A. Gray—2 claims, 2 figures.

—AES—

No. 2,738,318, March 13, 1956—Electrodeposition of Copper from an Acid Bath—R. Fellows and E. Hoover, assignors to The Udylite Research Corporation. Detroit, Mich.

This bath for the electrodeposition of copper (acid) contains safarine, minor proportions of thiourea, acetyl thiourea, N-propionyl thiourea, N-trifluoacetyl thiourea, N-penta fluoropropionyl thiourea, N-furfuryl thiourea, dimethyl thiourea, or cyanoacetyl thiourea and a compound having the structure:



wherein

R_1 and R_2 = H, Me, Et

X = Cl, Br, I, F, SO_4, HSO_4, NO_3

Z = phenyl, naphthyl and substituted naphthyls

Example 2 gives the formulation:

$CuSO_4.5H_2O$	200 g/l
H_2SO_4	15
Janus Green B	0.01
N-trifluoroacetyl thiourea	0.006
Na-N-decyl sulfate	0.01–0.03
Temperature	70–95° F
Air agitation	

16 claims.

PATENT ABSTRACTS

No. 2,738,289, March 13, 1956—Hot Dip Aluminum Coating Process—W. Hodge, assignor to Surface Combustion Corp., Toledo, Ohio.

To prepare a ferrous metal to receive a hot-dip coating of aluminum the cleaned object should be in an aqueous solution (0.05–2 per cent) of an alkaline salt of an oxyacid of phosphorus with an alkali metal. Claim 2 describes the solution as operated at boiling and claim 3 specifically names trisodium phosphate.

9 claims.

—AES—

No. 2,738,293, March 13, 1956—Salt Bath for Treating Metals—H. Spence, assignor to Diamond Alakli Co., Cleveland, Ohio.

The bath consists of sodium hydroxide and sodium nitrite in approximately equal amounts along with potassium hydroxide, not more than 10 per cent of total weight of the salt. Other oxidizing agents are mentioned. To remove or clean oxides from metals the bath is operated at 650°–1050° F.

10 claims.

See also No. 2,738,294 by same inventor describing a salt bath system—14 claims, figure.

—AES—

No. 2,739,106, March 20, 1956—Method of Electroplating Copper Lead Alloy—W. Hespenheide and C. Faust, assignors to American Brake Shoe Co., New York, N. Y.

The method of copper-lead alloy plating consists of codepositing these metals from a bath containing 22.5–28 g/l of copper cyanide and some free cyanide along with 2.7–3.5 g/l of lead pyrophosphate and some excess alkali metal pyrophosphate. Example 1 describes a bath to deposit a 40:60 per cent copper-lead alloy as:

K-pyrophosphate ($3H_2O$)	100 g/l
KCN	34 g/l
CuCN	22.5 g/l
$PbCl_2$	2.7 g/l

Temperature, 165° F; *p*H, 8.5; cd, 30 asf.

8 claims.

—AES—

No. 2,739,110, March 20, 1956—Forming Oxide Films on Electrodes—R. Ruscetta and A. Torrisi, assignors to General Electric Co., N. Y.

A method of forming a dielectric film on a tantalum capacitor is claimed in which the tantalum to a forming voltage in a bath of ethanolime, ethylene glycol and ammonium borate which has been previously heated to 150° C to vaporize volatile constituents.

6 claims.

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AES NEWS

On May 12, at the 38th Annual Banquet of the Master's Electro-Plating Association, John J. Forbath, "MEPA Plating Man of the Year—1955," presented Julian Nelkin with a bronze plaque inscribed as follows: To honor Julian Nelkin for his devoted services and untiring efforts to promote good will and sound business practice towards the advancement of MEPA and Metal Finishing Industry. Presented with esteem and affection by the Masters' Electro-Plating Association, 1956."

Also at the MEPA Annual Banquet were J. Palik, President of the NAMF with Mrs. Palik; Mr. and Mrs. John Trumbour, "Metal Finishing;" Ezra Blount, Editor "Products Finishing"; Dr. S. Heiman, President AES and far left are Arch Doria, Editor "Plating Magazine" and Mrs. Doria.

L. to r.- George Burnley, Advertising Manager, Shooji Makiguchi, Head of the Research Section of the Tohei Plating Company, Tokyo, Japan, which is run by Takanori Tohei seen standing next to Al Korbelak. The Tohei Plating Company is the largest job shop in Japan and employs some 150 people

Takanori Tohei accompanied by his Research Chief, Shooji Makiguchi, were on a business trip through the metropolitan and New York area when they called on Sel-Rex Precious Metals, Inc. where Al Korbelak took them in hand. With him, they made a tour of plating shops in the Newark area, including Royal Plating Corp. in Newark and Volupte in Elizabeth. Their trip was to take them through Detroit, Chicago and Cincinnati where they looked up Ezra Blount, Editor of "Products Finishing," thence to Seattle and on home to Japan.

In the course of their visit at Sel-Rex, Al Korbelak was good enough to take them for a visit through National Headquarters.

John P. Nichols Named as The AES's New Secretary

The Executive Board takes pleasure in announcing the appointment last month of John P. Nichols as Executive Secretary of the American Electroplaters' Society. Nichols took charge of the Society's national headquarters on Monday, June 4.

Nichols

A general management and public relations specialist, Nichols brings to his new position a solid record and reputation spanning over twenty years.

For fourteen consecutive years, he was associated with the award-winning national educational, research and public relations agency, Institute of Distribution, Inc., that was cooperatively established and maintained by the nation's great distributive companies, including Sears Roebuck & Co., F. W. Woolworth Co., J. C. Penney Co., Montgomery Ward & Co., Melville Shoe Corporation et al. During that period, he served the Institute as Public Relations Director, later as Assistant General Manager in charge of operations, finally as General Manager.

At the Institute, he selected, trained and directed a headquarters staff of forty beside coordinating and servicing over 30 autonomous state chain store public relations associations coast-to-coast. For outstanding service to its industry, the Institute was cited four times by prominent Juries of Award during his five-year tenure as General Manager.

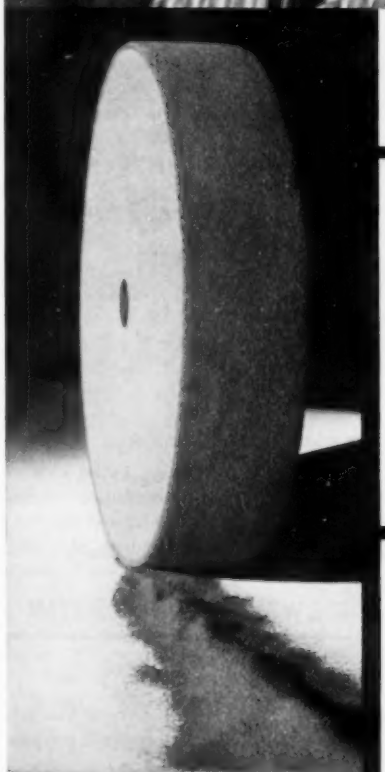
He was an Air Force Administrative and Public Relations Officer during World War II.

An alumnus of the Peddie School, Nichols was graduated from Columbia University in 1929. Among other affiliations, he is a member of the Military-Naval Club of New York, a Governor of the Columbia University Club of that city and a recent President of the Peddie North Jersey Club. An established author on economic subjects, a number of his books and other published works appear in the Library of Congress and in university and municipal libraries nationally, particularly, "The Chain Store Tells Its Story," that industry's official book.

1957 TRI-STATE REGIONAL AT FRENCH LICK, INDIANA

The Indianapolis Branch will be host to the 1957 Tri-State Regional meeting on Saturday, March 30, 1957 at the French Lick Springs Hotel at French Lick, Indiana. French Lick is about ninety miles southwest of Indianapolis and is a very beautiful place with accommodations for more than fifteen hundred persons.

You polish with the "Touch of Gold" when your wheels or belts are coated with ALUNDUM B abrasive. This extremely hard, sharp grain cuts fast, clean and cool. And the Norton special high capillarity treatment means easier wetting with cement or glue — for maximum adhesion, longer wheel life and better polishing performance.



Norton ALUNDUM B abrasive consists of grains of uniform blocky shape. No flats, slivers or undersize grains to loaf on the job. No oversize grains to mar surfaces. Made in all grit sizes, from 20 through 240, to cover the widest range of polishing operations.

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Ask Your Norton Distributor for the booklet "Setting Up Metal Polishing Wheels and Belts." Or write to the nearest district office of NORTON COMPANY, Worcester 6, Mass. Distributors in all industrial areas, listed under "Grinding Wheels" in your phone book, yellow pages. Behr-Manning Company, Troy, N. Y., div. of Norton Company. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Massachusetts.

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AES NEWS

Miami Becomes 55th Branch Prospect

Fifteen members met on April 25 in Miami, Florida to form a nucleus of a Miami Branch of the Society. Miami which should become the 55th Branch of the Society has already petitioned for a Temporary Charter and, in a few months, that Branch plans for the application of a Permanent Charter.

Credit for the organization of the Florida Branch goes to G. M. Rodgers of Hanson-Van Winkle-Munning Company and to E. Owens of National Airlines who gave of time, money and energy in its formation.

New officers elected at the April 25 meeting include Charles Poshner, President, of Century Plating, Inc.; M. H. Dent, First Vice-President of Pan American Airways; E. Owens, Second Vice-President, National Airlines; Charles P. Jenkins, Secretary, of Airco Plating Company, and George L. King, Treasurer, of Airco Plating Company.

The last Wednesday of each month was tentatively designated as the regular meeting date.

WILFRED S. McKEON

It is with deep regret that we report on the death of Wilfred S. McKeon.

Born in Scottdale, Pa., he lived for 35 years in Greensburg, where he was president of the Sulphur Products Co.

Wilfred was one of the founders and a past president of the International Fellowship Club. He was also a charter member of the American Electroplaters' Society, Pittsburgh branch, is survived by his wife Alma and his sister. He will be sadly missed by his many friends.

AWARD WINNERS

1st Prize—Carl E. Heussner Award

Dr. Charles L. Faust and William H. Safranek of Battelle Memorial Institute, Columbus, Ohio, were recipients of the year's top paper awards of the American Electroplaters' Society in the Nation's capital. For their paper, "The Study of Copper Anodes in Acid and Cyanide Plating Baths," both men received the Carl E. Heussner award consisting of the AES Gold Medal, a cash prize and an award certificate. This award is co-sponsored by the AES and the United Platers' Foundation of Detroit, Michigan.

The prize-winning paper was selected for "its high immediate value to the industry along with important new scientific information dealing with a wide spread problem in most plating shops."

2nd Prize—George B. Hogaboom Memorial Award

For the second best paper, the George B. Hogaboom Memorial Award went to R. V. Vanden Berg of the Aluminum Company of America, New Kensington, Pa. His paper was "The Commercial Anodizing Surface Treatments for Aluminum and Its Alloys." This award consisted of the AES Silver Medal, a cash prize, and an award certificate co-sponsored by the AES and the Hartford, Connecticut Branch of the Society.

Vanden Berg's paper was chosen "because of the great increase in the use of aluminum and the necessity for more information on surface treatments of aluminum."

3rd Prize—The AES Bronze Medal Award

J. J. Shyne, Reaction Motors, Inc., Denville, N. J.; N. N. Barr, Glenn L. Martin Co., Baltimore, Md.; H. G. Scheible, Vitro Lab., Div. of Vitro Corp., West Orange, N. J. and W. D. Fletcher, Eglin Airforce Base, Florida were recipients of the AES Bronze Medal, co-sponsored by the AES and the Grand Rapids Branch of the Society. This award consisted of a bronze medal and a cash prize and was adjudged third best because "it reveals a new type of process to our industry using a wide variety of new materials," applications of which should greatly increase with the rising interest in new finishes required by the missle and jet engineering industries. Their paper was "Electrophoretic Deposition of Metallic and Composite Coatings."

4th Prize—The Robert S. Leather Mechanical Finishing Award

(no award)

5th Prize—The Chromium Plating Award

For the best paper on chromium plating, the AES Chromium Plating Award went to Dr. J. E. Stareck, Dr. E. J. Seyb and A. C. Tulumello, all of the Research Laboratories of United Chromium, Inc., Detroit, Michigan. Co-sponsored by the AES and the Nutmeg Chrome Corporation, West Hartford, Connecticut; this award consists of a cash prize and a certificate. Their paper was "The Effect of Different Chromium Deposits on the Fatigue Strength of Hardened Steel."

6th Prize—The Precious Metal Plating Award

Dr. Harold J. Wiesner and H. A. Meers of Bendix Products Div., Bendix Aviation Corp., South Bend, Indiana, were recipients of this award for the best paper in precious metal plating.

For their paper "Further Studies in Heavy Rhodium Plating," Wiesner and Meers received a cash award and a certificate, co-sponsored by the Society and Technic, Inc., Providence, R. I.

Presentation of awards was made by National President Clyde Kelly of Des Moines, Iowa, and featured the opening session of the 43rd Annual Convention of the American Electroplaters' Society at the Washington Hotel Statler.

The Officers of the MFSA

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This group of pictures appeared in the June issue with incorrect captions. They are rerun here with our apologies.

INTERSOCIETY NEWS

ASTM B-8 TO CONDUCT WEST COAST SYMPOSIUM—SEPTEMBER 19

A symposium on electrodeposited metallic coatings will be presented by ASTM B-8 at the Los Angeles Hotel Statler on Wednesday, September 19, 1956. The program will feature a morning and afternoon session under the direction of Walter L. Pinner of Houdaille Industries, Inc.

The following are in charge of arrangements: Dr. P. James Rich, West Coast Representative and Chairman, Technical Program Committee; and F. L. LaQue, Papers Committee Representative.

The symposium will be a "repeat" of the successful Buffalo Spring Meeting and, in addition, will include two new papers. The program:

History of ASTM Committee B-8, WILLIAM BLUM, Retired (formerly Director of Chemistry Section, National Bureau of Standards.)

Corrosion Behavior and Protective Value of Decorative Copper-Nickel-Chromium and Nickel-Chromium Coatings on Steel, C. H. SAMPLE, International Nickel Company.

Evaluation of Methods Available for Measurement of Surface Luster of Electroplated Coatings, GLADE BOWMAN, Standard Steel Spring Division, Rockwell Spring and Axle Company.

Metal Cleaning Prior to Electroplating, S. SPRING, Pennsalt Manufacturing Company.

Comparison of the Corrosion Behavior and Protective Value of Electro-Deposited Zinc and Cadmium Coatings on Steel, C. H. SAMPLE AND R. B.

(Continued on page 948)

AES MEMBERSHIP REPORT

ELECTIONS

Baltimore-Washington: C. W. Boll, Jr., N. Heller, T. L. Johnson, C. A. Laubsch, C. W. McDanald, R. A. Ott, H. S. Peck, Jr.
Buffalo: H. Chessin, R. W. Hess, R. C. Jerome, R. Luciura, K. J. Mau, C. N. Wagenblott, N. P. Wikner
Cincinnati: S. H. Palmer, G. H. Poll, Jr.
Dayton: R. F. Fookaman, L. H. Hadlock
Detroit: E. L. Abbott, D. C. Cywinski, J. Hipolyt, L. M. Isotalo, J. L. Murray, C. H. Reeme, F. S. Wesley
Hartford: M. A. Nigro, R. G. Messenger
Los Angeles: T. I. Goodman, M. Weiner
Louisville: L. O. Dunavan, J. D. Evans, L. D. Kleier, K. E. Walden
Milwaukee: S. Dexter, E. Garchime, C. Klevickis, H. Weiley
Mississippi: S. M. Baker, R. L. Hamner, L. Maloney, H. J. Meyer, J. S. Mohr, W. E. Montgomery, M. W. Witherspoon
Newark: D. Bauman, W. J. du Fosse, E. F. Gut, J. Lagan, A. Ronzo
New York: R. F. Cosentino, J. F. Healy, I. I. Wolkenfeld
Pittsburgh: A. J. Chinnici, C. R. Harr, A. J. Jantsch, W. S. McCormick, A. S. Mickelson, S. M. Robertson
Rochester: C. G. Hilberer
Rockford: K. J. Gatchel, J. D. Williams
St. Joseph Valley: D. V. Springer
San Francisco: F. J. Aguilar, E. Hecht, R. E. Leitner, J. Rodriquez, R. A. Young
Seattle-Puget Sound: W. L. Cotton, R. H. Smith, A. J. Wright, Jr.
Sydney: R. H. Townsend
Toronto: E. M. Moore, D. G. Newman
Member-at-Large: K. Maurer, Soleure, Switzerland; J. E. McCarthy, Danville, Illinois; M. Tenenbaum, Bronx, New York

REINSTATEMENTS

Buffalo: K. R. Humes
Detroit: N. Godo, A. Partensky

TRANSFERS

Dayton: E. C. Huxley, from Cincinnati
Detroit: F. Cook from Grand Rapids
Philadelphia: S. Spring to Los Angeles
Saginaw Valley: H. R. Shimel to Toledo
St. Louis: K. S. Repp to Los Angeles, H. J. Struckhoff to Los Angeles
Seattle-Puget Sound: J. B. Mohler from Pittsburgh
Springfield: G. LaFrancis from New Haven

RESIGNATIONS

Baltimore-Washington: F. P. Brodell
Buffalo: P. C. Clark, E. V. Hess
Central Michigan: F. E. Gazley
Cincinnati: T. McCammon, J. Merton, H. Palmer, R. A. Pfefferle, F. Schrimper, C. R. Sorber
Columbus: H. L. Moore
Hartford: C. W. Peterson
Los Angeles: R. J. Husband, S. W. Mashburn, J. P. Powell, E. Thornton, C. Weber
Louisville: G. A. Logsdon
Rochester: L. Buraks, J. Hudgins, C. Rosenbauer
St. Louis: R. Maag
Sydney: A. W. Burns, A. J. Gunton, F. J. Henkel, C. G. Wheen
Waterbury: J. J. Carr, J. F. Vuolo
Wichita: H. D. Burgess, E. K. Hall, M. D. Jones, F. E. Michael, J. Springer

SUSPENSIONS

Chicago: E. F. Gester, M. F. Surrey, G. W. Runtz
Cincinnati: W. Fritz, R. B. Preston, H. E. Sigwell
Dayton: J. D. Hoffman, A. Watson, Jr., R. C. Worley
Los Angeles: R. E. Baugh, R. C. Berry, F. B. Board, G. E. Boehmer, E. Bustamente, J. M. Carter, E. B. Delamater, C. Israel, R. Lostutter, R. S. Patterson, C. A. Petre, A. Regmunt, A. S. Riojas, R. M. Stutzman, G. A. Urry, W. A. Vensel, F. S. Witte
Louisville: W. R. Haines, Jr., M. Vowels
Philadelphia: F. H. Krienitz
Rockford: B. R. Masbach, D. Setterquest, J. R. Sorenson

DEATHS

Newark: F. Barile
Pittsburgh: W. S. McKeon

Two more progressive firms have joined the AES Research effort through the important medium of the Sustaining Membership program. The new firms are:

Firm and City	Branch Credit
Rheem Automotive Co. Los Angeles, Calif.	Los Angeles
Superior Polishing Co. Van Dyke, Mich.	Detroit

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Number of Sustaining Members supporting AES Research through last month 343

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INTERSOCIETY NEWS

(*Continued from page 947*)

TEEL, International Nickel Company, AND A. MENDIZZA, Bell Telephone Laboratories.

Evaluation of Supplementary Coatings, R. E. HARR, Western Electric Company.

Atmospheric Exposure of Electroplated Lead Coatings on Steel, A. H. DuROSE, Harshaw Chemical Company.

The Standard Salt Spray Test—Is It a Valid Acceptance Test?, A. MENDIZZA, Bell Telephone Laboratories.

Radioactive Isotope Dilution Method for Determining Sulfate Concentration in Chromium Plating Baths, L. O. GILBERT, Rock Island Arsenal.

Phosphate Coating Over Zinc Plated Parts, A. L. ALEXANDER, Naval Research Laboratory.

ARTICLE REFERENCES

By
WILLIAM TUCKER
Eastman Kodak
Rochester, N.Y.

Most of the articles listed here may be obtained by writing to the Publication. Addresses are included for the reader's convenience.

Photostat or microfilm copies of articles in available magazines may be obtained from: Library of Congress, Washington, D. C.; New York Public Library, New York; Engineering Societies' Library, New York, at prevailing rates. In other cases, consult Wilson's Union List of Serials at your nearest public library for other sources of these articles.

---

98. ALLOY

a. *GROWTH OF GALVANIC DEPOSITS. X. GOLD-COPPER ALLOYS.* (German)
E. Raub and F. Sautter
Metalloberflache, V. 10, No. 3, March 1956, p. 65–72
Growth and properties of deposited gold-copper alloys; effect of cyanide content on electrolytic deposition of copper in cyanide baths; deposit of gold-copper alloys from low pH baths or low cyanide content; mixed crystals between gold and copper in deposits. Tables, graphs, 8 ref.

99. ALUMINUM

a. *INFLUENCE OF ANODIZING VARIABLES ON THE GROWTH AND VARIOUS PROPERTIES OF THE OXIDE FILM* (German)
D. Lenz
Aluminum, V. 32, No. 3, March 1956, p. 126–135
Optical and chemical properties are deduced from anodizing in sulfuric acid. Processes occurring during anodizing; effect of electrolyte, current density, voltage and temperature on structure of the oxide film, with special reference to the shape and size of the specimens; thickness of the nonporous primary film; dimensions of the oxide cells and of their cup-shaped primary films. Table, graphs, diagrams, micrographs. 14 ref. (to be continued).

b. *PREFINISHED ALUMINUM*
R. V. Vanden Berg
Product Engineering, April 1956, Vol. 27, No. 4, p. 135–138

100. ANALYSIS

a. *ANALYSIS OF ELECTROPLATING SOLUTIONS—ESTIMATION OF BORIC ACID IN THE PRESENCE OF NICKEL AND AMMONIUM SALTS*
M. R. Verma and K. C. Agrawal
Metal Finishing, May 1956, Vol. 54, No. 5, p. 64–65

101. ANODIZING

a. *SURFACE TREATMENT AND FINISHING OF LIGHT METALS. PART VIII. HARD ANODIZING*
S. Wernick and R. Pinner
Metal Finishing, May 1956, Vol. 54, No. 5, p. 52–55

b. *ANODIZED ALUMINUM: RAINBOW HUES HAVE "POT-O'-GOLD" FUTURE*
W. G. Patton
The Iron Age, May 3, 1956, Vol. 177, No. 18, p. 95–97

102. BRIGHT PLATING

a. *BRIGHT PLATING: A THEORY AND RESEARCH PLAN*
C. Fred Gurnham
Products Finishing, May 1956, p. 56–64

103. CHROMIUM

a. *HARD CHROMIUM PLATING OF STEEL—SUMMARY OF D.T.D. SPECIFICATION 916A*
Electroplating and Metal Finishing, May 1956, Vol. 9, No. 5, p. 152–153

104. COPPER

a. *INTERNAL STRESSES IN GALVANIC COPPER DEPOSITS* (German)
Hellmuth Fischer, Peter Huhse and Franz Pawlek
Zeitschrift für Metallkunde, V. 47, No. 1, January 1956, p. 43–49
Internal stresses in galvanic deposits of copper determined by magnetic and mechanical methods in relation to inhibitor concentration. A closely related variation of stress, hardness and texture observed with β-napthoquinoline. Graphs, diagrams, micrographs. 7 ref.

105. CORROSION

a. *CORROSION OF COPPER-GOLD ALLOYS BY OXYGEN-CONTAINING SOLUTIONS OF AMMONIA AND AMMONIUM SALTS*
J. I. Fisher and J. Halpern
Journal of the Electrochemical Society, Vol. 103, No. 5, May 1956, p. 282–286

b. *ACCELERATION OF THE DISSOLUTION OF IRON IN SULFURIC ACID BY FERRIC IONS*
Harry C. Gatos
Journal of the Electrochemical Society, Vol. 103, No. 5, May 1956, p. 286–291

c. *ALUMINUM IN CONTACT WITH OTHER MATERIALS*
Aluminum Development Association, Information Bulletin No. 21, December 1955, 48 p.

d. *THE PREVENTION OF FRETTING CORROSION*
R. B. Waterhouse
Corrosion Prevention and Control, Vol. 3, March 1956, p. 37–39

e. *GALVANIC CORROSION PROPERTIES OF TITANIUM IN ORGANIC ACIDS*
David Schlain, Charles B. Kenahan and Doris V. Steele
U.S. Bureau of Mines, Report of Investigations 5189, January 1956, 17 p.

106. FILTRATION

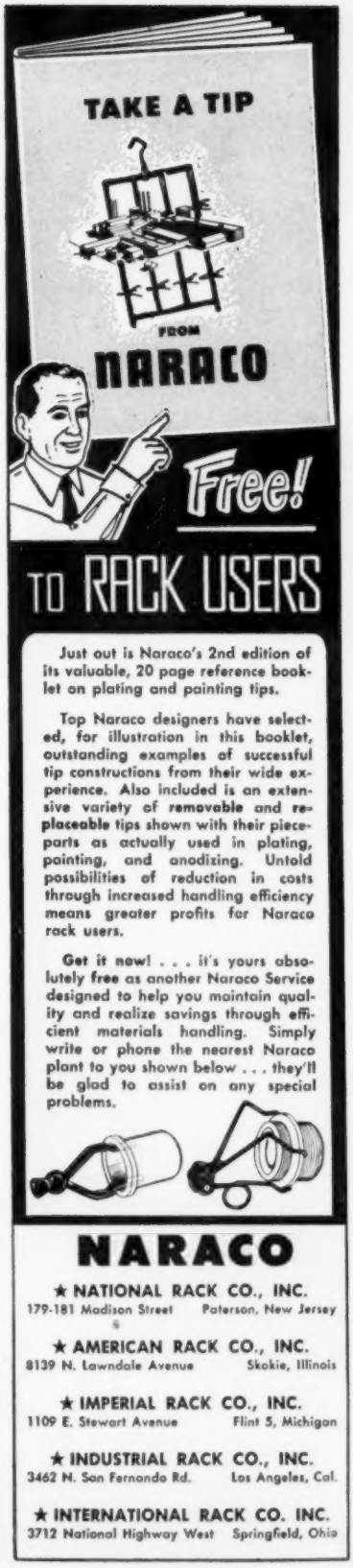
a. *FILTRATION OF PLATING SOLUTIONS*
Products Finishing, May 1956, p. 28–32

107. FINISHING

a. *MAIZE CELLULOSE AS A FINISHING MATERIAL*
William Karr
Metal Finishing, Vol. 54, No. 5, May 1956, p. 56–57

108. NICKEL

a. *PREPARATION OF PURE NICKEL BY ELECTROLYSIS OF A CHLORIDE SOLUTION*
W. A. Wesley
Journal of the Electrochemical Society, Vol. 103, No. 5, p. 296–300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ARTICLE REFERENCES

109. ORGANICS

a. *RECENT NAVY EXPERIENCE WITH SARAN AND VINYL COATINGS*
W. W. Cranmer
Corrosion, Vol. 12, No. 5, May 1956, p. 65–66

110. PHOSPHATING

a. *LOSS OF WATER OF HYDRATION FROM PHOSPHATE COATINGS DETERMINED RADIOMETRICALLY*
Stanley L. Eisler, Jodie Doss and W. Dennis McHenry
Organic Finishing, May 1956, p. 5–9

111. STRESS

STRESS IN ELECTRODEPOSITED COATINGS. ITS SIGNIFICANCE AND MEASUREMENT
Joseph B. Kushner
Metal Finishing, Vol. 54, No. 5, May 1956, p. 58–63

112. TIN

a. *ELECTRO-CHEMICAL TINNING OF IRON SHEETS IN CHLORIDE SOLUTIONS* (Russian)
V. P. Kochergin, T. A. Nimvitzkaia and M. Ia. Viunova
Zhurnal Prkladnoi Khimii, V. 29, No. 1, January 1956, p. 59–63
Tinning from acid solutions produces porous, lusterless surfaces on cold rolled iron sheets; however, tinning from acid solutions of sheet previously treated in basic tin solution, at a cathode current density of 1 to 2 amp/sq dm, gives a bright surface and very low porosity. Graphs, 14 ref.

b. The following were taken from Electroplating and Metal Finishing, Vol. 9, No. 5, May 1956—Preliminary report on Institute of Metal Finishing Annual Conference, Blackpool, May 1956

113. BRIGHT ANODIZING ALUMINUM

a. *ALKALINE ELECTRO-BRIGHTENING AND ANODISING OF ALUMINUM*
N. D. Pullen and B. A. Scott
(British Aluminum Co.)

b. *SOME STUDIES OF PHOSPHORIC ACID BASED CHEMICAL BRIGHTENING SOLUTIONS FOR ALUMNUM*
A. W. Brace (Aluminum Laboratories, Banbury) and T. S. Degomoboy (Research Investigator, Battersea Polytechnic)

c. *CHEMICALLY BRIGHTENED AND ANODISED ALUMINUM AND ITS EMPLOYMENT IN AUTOMOBILE MANUFACTURE*
F. Baumann and H. Neunzig
(Vereinigte Aluminum Werke, Germany)

d. *STUDIES IN BRIGHT ANODISING BY THE AMMONIUM BI-FLUORIDE-NITRIC ACID PROCESS*
G. E. Gardam and R. Peck (Aluminum Laboratories, Banbury)

114. CHEMICAL POLISHING OF STEEL

a. *SMOOTHING OF MILD STEEL BY BARREL TREATMENT IN OXALIC ACID-HYDROGEN PEROXIDE SOLUTION*
K. Sachs and M. Odgers
(G.K.N. Group Research Laboratory)

115. MISCELLANEOUS PLATING PROCESSES

a. *INDUSTRIAL NICKEL COATING BY CHEMICAL CATALYTIC REDUCTION*
G. Gutzeit
(General American Transport Corporation, Chicago)

b. *PRACTICAL BRUSH PLATING*
H. D. Hughes
(Metachemical Processes Ltd.)

c. *THE ELECTRODEPOSITION OF TIN-ZINC ALLOYS FROM STANNATE-COMPLEXONE SOLUTIONS*
A. E. Davies and R. M. Angles
(Tin Research Institute)

d. *A PRELIMINARY INVESTIGATION OF THE FORMATION OF CRACKS IN HARD CHROMIUM ELECTRODEPOSITS AND THE EVOLUTION OF HYDROGEN DURING DEPOSITION*
C. P. Brittain and G. C. Smith
(University of Cambridge)

116. ELECTROPLATING PLANT

a. *AUTOMATIC PLANT FOR BRIGHT ZINC PLATING*
J. Chadwick
(Joseph Lucas (Industries) Ltd., Birmingham

b. *THE GENERAL AND CHEMICAL ENGINEERING ASPECTS OF ELECTROPLATING PLANT*
H. C. Clements
(W. Canning and Co. Ltd.)

117. ORGANIC FINISHING

a. *LABORATORY EVALUATION OF PAINT DURABILITY—ACCELERATED WEATHERING TESTS*
T. R. Bullett
(Paint Research Station, Teddington)

b. *POLYTETRAFLUOROETHYLENE DISPERSIONS IN METAL FINISHING*
E. M. Elliott
(Imperial Chemical Industries, Plastics Division)

c. *THE PAINTING OF MAGNESIUM ALLOY SURFACES AND THE PRINCIPLE OF SURFACE SEALING*
W. F. Higgins
(Magnesium Elektron Ltd., Manchester)

d. *ELECTROFORMED SPRAY MASKS*
P. Spiro
(London and Scandinavian Metallurgical Co. Ltd.)

118. The following are metallurgical abstracts taken from The Journal of the Institute of Metals, London, March 1956:

a. *THE GALVANIC COUPLE ALUMINUM/GRAPHITE IN THE CORROSION OF LIGHT ALLOYS*
Anna Prati (Rapp.)
Congrés Internat. Aluminum (Paris), 1954, (II), 39–47; Discussion 47

b. *PASSIVITY PHENOMENA OF NICKEL*
Karl Hauffe and Irmtraud Pfeiffer (Z Metallkunde, 1954, 45, (9), 554–562)
Determinations have been made of the current/potential curves of clear (polished) and of oxidized Ni in 0.1N-H_2SO_4 with and without addition of KBr, the NiO films were produced by heating at 400° and 1000° C to give oxide layers 1000 A. and 10 μ thick, respectively. The results are described in detail. It is shown that the formation and dissolution of the resulting passive NiO surfaces can be explained in terms of the Mott-Cabrera theory of oxidation, of the boundary-layer theory of ionosorption (= chemi-sorption), and of current transport in ionic crystals. The fact that Br ions attack not only polished Ni but also polished Ni covered with a passive NiO film, indicates that even a pore-free NiO film does not protect Ni from halogen ions, a result which is in agreement with theoretical considerations. The experiments also show that a residual passive film persists even after the anodic current is switched off, and that such a film is markedly resistant to 0.1N H_2SO_4. 19 ref.

c. *A CONTINUOUS PROCESS FOR THE ANODIC OXIDATION OF ALUMINUM WIRE AND STRIP*
Marcel Bardot (Rapp)

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Congrés Internat. Aluminum (Paris), 1954, (II), 57–61; Discussion 61) (In French)

B. describes an industrial plant for the continuous anodizing of Al wire and strip in long lengths, the former mainly for windings for electrical plant and the latter for subsequent stamping of small articles. The bath used consists of H_2SO_4 with the addition of chlorides, and with single-phase ac superimposed on dc, using very high cd to secure very rapid anodizing.—15–30 sec against 30–50 min for the usual batch anodizing. This gives an anodic film of great pliability and high electrical resistance, both being further improved by a final impregnation with synthetic resin. The whole plant is entirely automatic, up to 24 coils of wire or strip being fed in at one end and the completed anodized and impregnated material wound on to spools at the other end. The bath itself is divided into three sections, through which the material passes in turn, the first being fed with dc at 10–15 v, and the last two with ac at 15–55 v; the bath composition of the three sections is varied according to circumstances. Electrical contacts with the material are under water.

d. *THE IMPROVEMENT OF BEARINGS BY ELECTRODEPOSITION (OF LEAD, LEAD-INDIUM AND LEAD-TIN COATINGS)*
W. Roggendorf
Metalloberfläche, 1955, (A) 9, (5), 76–77

e. *THE ELECTRODEPOSITION OF LEAD-TIN ALLOYS*
Ernst Raub and Walter Blum
Metalloberfläche, 1955, (A), 9, (4), 54–57. (extended abstract)

f. *ELECTRODEPOSITION OF NICKEL FROM CHLORIDE AND SULPHATE SOLUTIONS*
Ernst Raub
Metalloberfläche, 1955, (A), 9, (6), 88–93. (extended abstract)

g. *THE LANCY PROCESS FOR THE TREATMENT OF TOXIC PLATING-SHOP EFFLUENTS (PRINCIPALLY WASH WATERS)*
Richard Springer
Metalloberfläche, 1955, (B), 9, (5), 65–69. (extended abstract)

h. *THE PASSIVITY OF IRON-CHROMIUM ALLOYS*
R. Olivier
Proc. 6th Meeting Internat. Cttee. Electrochem. Thermodynamics and Kinetics (Poitiers, 1954), 1955, 314–331; discussion 332–333. (extended abstract)

i. *THE ELECTROLYTIC PRODUCTION OF (LEAD-CALCIUM) BEARING ALLOY LCa*
Z. Maslanka-Ormanowa
(Prace Inst. Minist. Hutn., 1954, 6, (6), 305–314 (In Polish). (extended abstract)

j. *THE MECHANISM OF ELECTROLYTIC POLISHING*
S. Feliu and M. Serra
Proc. 6th Meeting Internat. Cttee. Electrochem. Thermodynamics and Kinetics (Poitiers, 1954), 1955, 483–491; discussion 491

k. *APPLICATIONS OF RADIOACTIVE METHODS TO THE STUDY OF SURFACE STATES AND SURFACE REACTIONS OF METALS*
M. Haissinsky.
Proc. 6th Meeting Internat. Cttee. Electrochem. Therodynamics and Kinetics (Poitiers, 1954), 1955, 98–112; discussion 112

. *THE CHEMICAL BRIGHTENING OF BRASS AND NICKEL-SILVER. III. THE CHEMISTRY OF THE BRIGHTENING PROCESS.*
Gerhard Schmid and Heinz Spähn
Z. Metallkunde, 1955, 46, (2), 128–137. (extended abstract)

ADDRESSES OF SOURCES

Aluminum
Verlag der Aluminum-Zentrale e.V.
Dusseldorf
Alleestrasse 31
Germany

Electroplating and Metal Finishing
85 Udney Park Rd.
Teddington, Middlesex,
England

Iron Age
Chilton Co., Inc.
100 East 42nd St.
New York 17, N. Y.

Journal of the Electrochemical Society
216 West 102nd St.
New York, New York

Journal of the Institute of Metals
4 Grosvenor Gardens
London, S.W.1, England

Metal Finishing
381 Broadway
Westwood, N. J.

Metalloberflache
Carl Hanser
Zeitschriftenverlag GmbH
Munchen 27
Leonhard-Eck-Strasse 7
Germany

Organic Finishing
381 Broadway
Westwood, N. J.

Product Engineering
Sawell-Publications, Ltd.
4 Ludgate Circus
London, E.C. 4, England

Products Finishing
431 Main Street
Cincinnati 2, Ohio

U S Bureau of Mines
Office of Technical Services
Department of Commerce
Washington 25, D. C.

Zeitschrift fur Naturforschung
Verlag der Zeitschrift fur Naturforschung
Tubingen
Mathildenstrasse
Germany

Zhurnal Prikladnoi Kimhii
Izda tel'stvo Akademii Nauk SSSR
Leningrad, B. O.
Mendeleevskaia lin., d.1
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As the committee registered: Art Pierdon, Bill Metzger, Dr. and Mrs. Blum

The Janises, Duke Wysong (new AES Third Vice President) and B. Kirchoff

Corner conference

Jules Horelick addresses Opening Session Business Meeting

At the MFSA meeting: W. D. MacDermid, A. P. Munning, J. Clifford, and W. A. Helbig

"A good joke" Mrs. A. Pierdon, Mrs. W. Hoffman, Miss Margaret Pierdon

A happy group that includes John Gumm, Joan Wairda, Bill Trusdell and Mrs. Gumm

Dr. and Mrs. Brenner at the get-together

Dr. G. Swift, K. Huston, C. Thiede and F. MacStoker

Art DuRose new chairman Research Board, at the get-together

Past Presidents Swift, Wagner and Huston with Thiede on the mezzanine

The Hoffmans waiting to register

Dr. Allen V. Astin, Director of National Bureau of Standards, Keynote speaker

New AES President Dr. S. Heiman and Mrs. Heiman

M. Messing and A. Korbelak of Bart-Messing and Sel-Rex

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J. P. Nichols, Clyde Kelly, Mrs. J. P. Nichols and Mrs. Florence Marquardt

L. to R.: Mr. & Mrs. Herman Elies, Mr. & Mrs. William Holzendors, Angelo Lazaro

The Wm. Marcovitches

The Nat Halls and the Joe Kushners

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The Pierdons—father, son and granddaughter

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Mr. and Mrs. M. Glover meet up with Valvano in the registration line

Dr. Blum addresses the Opening Session

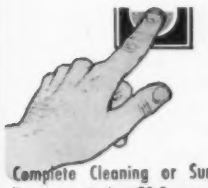
Mrs. Arthur Pierdon at the Opening Session

Dr. Vanden Berg, Alcoa paper award winner talks with George Burnley of PLATING

Last year's Chairman, E. Combs, has a pre-dinner confab with this year's Chairman A. Pierdon

The first are first again. Mr. & Mrs. Charles T. McGinley of St. Louis were first registrants repeating last year's performance.

Dr. D. Foulke meets up with Mrs. Marquardt



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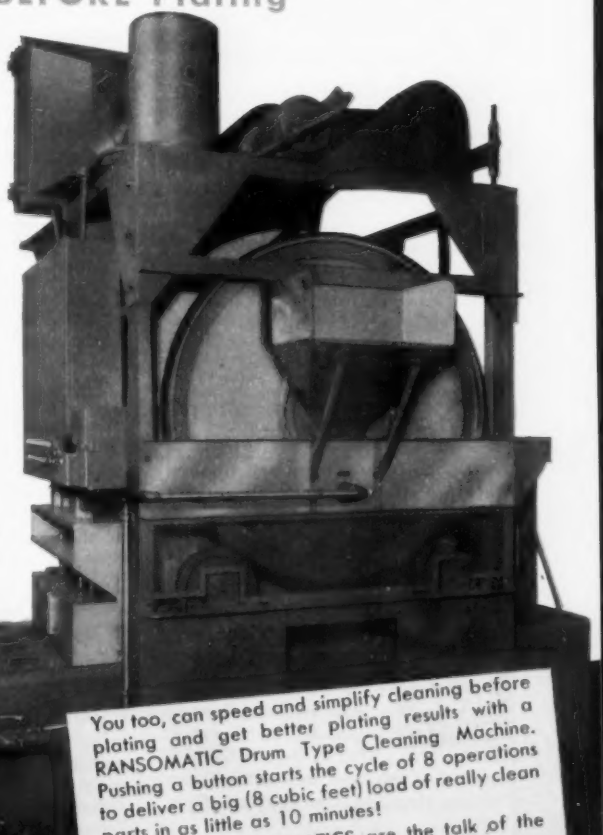

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BRANCH NEWS

New Adelaide Branch Officers, l. to r.: M. K. Birrell; T. Pearce, Pres.; and W. Minahan

ADELAIDE

Tom Pearce Returned as President

At the annual general meeting on Friday, March 23, **Tom Pearce,** manager of Electroplating Industries Ltd., was unanimously elected President for a further term.

Pearce has served on the committee of the Society in Adelaide for many years, and has always proved a most popular and valued member.

Vice-Presidents elected were: **M. K. Birrell** and **W. Minahan.**

M. K. Birrell conducts his own business at Finsbury where he specializes in barrel plating in which he has been engaged for eight years. Prior to this Birrell's experience was gained in several of the leading plating establishments around Adelaide. His service to the Society extends over a period of eight years.

W. Minahan has had 10 year's experience in the plating industry and was one of the first engaged in the bright nickel process in S. A. Prior to going into partnership with his two colleagues forming Carrington Platers at Norwood, Minahan had considerable experience with Universal Platers. Bill has served on the committee of the Adelaide branch of the AES for a relatively short time, but has proved his worth in promoting the Society.

The 1956 Committee comprises the President and Vice-President ex-officio **Pearce** and **Birrell, Strugnell Blanch, Watson, Platten, Church, McNamara** (**Down**—Secretary).

The meeting was held at the Builders' Exchange Rooms at Waymouth Street, Adelaide and concluded with supper by courtesy of John Blanch Pty. Ltd.

ALLENTOWN-READING

Ulrich President

The meeting was held at Scotty's Anchorage in Emmaus, Pa., on Thursday, April 26, 1956. After the regular business meeting, a film was shown by Turco Products, Inc., on their product Dye-check.

The following Officers were elected for the year 1956–1957: **John Ulrich,** President; **Henry Iobst,** 1st Vice-President; **Harold Bowen,** 2nd Vice-President; **Raymond Housel,** Secretary and Treasurer; **James Stettler,** Librarian. Board of Governors: **Leroy Kreider, Howard Shearer, Malcolm Merkel.**

There were 19 members and guests in attendance.

James Stettler
Librarian

BRIDGEPORT

New Officers Elected

The regularly scheduled business meeting and educational session of the branch, was held in the main ballroom of the Hotel Barnum on April 13.

Acting President **L. Bonazzo** called the meeting to order with 37 members and guests present.

The following were elected to the respective offices of the branch for the fiscal year 1956–57: President, **Robert E. Bonazzo;** 1st Vice-President, **Floyd Tatum;** 2nd Vice-President, **M. Tamas;** Secretary-Treasurer, **Bob Parker;** Sergeant-at-arms, **Wm. Hyatt, Jr.;** Board of Managers: **W. Ehrencrona, H. Braun, Ray Goral, Wm. Lindsay;** Delegates: **R. Barrett, C. Temple, F. Richards;** Alternates: **C. Sievert, F. Tatum, R. Goral.**

The branch voted that no summer outing would be held. Also, that the two oldest members (continuous membership in the branch) would be honored as guests of the branch at Olde Tymers Nite.

Honorary membership certificates were prepared, framed and presented to **Howard G. Rice** and **Raymond O'Connor.** Wm. Ehrencrona was to have received one, but the presentation was postponed. Howard G. Rice acknowledged the honor bestowed by recounting some of his past experience in the branch. Ray O'Connor added some of his in an acceptance speech.

Charles Temple won the door prize. Television viewing of the Friday night fight was offered and refreshments were served.

Bob Parker
Secretary-Treasurer

BUFFALO

A Picnic is Announced; Fabry Speaks

The Buffalo branch meeting was held May 4, at the Markeen Hotel.

Two new members were admitted to the Buffalo branch: **Hyman Chessin,** Olena, N. Y.; **Kenneth Mau,** Buffalo, N. Y.

The picnic is to take place July 21, at Edgewater Park Hotel, Grand Island, N. Y. from 1:00 P.M. to midnight.

S. A. Fabry of Belke Mfg. Co. spoke on the subject "Design and Construction of Plating Racks."

Eric G. Sampson, Jr.
Secretary

CINCINNATI

Tatoian Speaks on Polarography

The meeting was called to order by President **Roof. John Hoover,** reporting for the Auditing Committee, said that the Treasurer's books were in good condition as of May 1, 1956.

Sherman Palmer and **Gerald Poll** were accepted into the membership.

Don Gusse reporting for the Educational Committee said that plans have already been made for speakers at next year's meetings and that more speakers are being contacted.

President Roof appointed the following to the Membership Committee: **Wilson Loveless,** Chairman; **Lester Helmich,** Vice-Chairman; **Ray Barry, Stewart Chipman, Charles Dumont, Richard Evans, Arthur Gerada, William Gordon, Lee Howald, Albert Jacobs, Harold Webb, William Young, Willis O'Brien.**

Del Taylor, chairman of the Picnic Committee, reported that the plans for the picnic were complete and that the ball game between the "Platers and Suppliers" would start at 5:30 P.M.

Roger Winterman was appointed as a representative to the Tri-State Meeting.

The speaker for the evening was **G. Tatoian** of the Patwin Instrument Company. Tatoian gave a very interesting talk on "Polarographic Analysis of Plating Solutions."

David L. Kaplan
Secretary

COLUMBUS

New Officers Elected

The regular May meeting and annual banquet of the Columbus branch was held at Presuttis Villa on May 18.

After an excellent dinner President **Nate Koslin** called the business meeting to order.

Arthur H. Pollack of Industrial Platers Columbus, O. was elected to membership.

President Koslin then praised the officers for the past year and asked **Bill Neill** to present the Officers and Delegates for

the year 1956–7. These are as follows: President, **Bill Shriver;** 1st Vice-President, **Calvin Smith;** 2nd Vice-President, **Rudy Skriletz;** Secretary, **Halvor Christianson;** Treasurer, **Bill Hespenheide;** Librarian, **George Skelly.** Board of Managers: **Charles Faust, Nate Koslin, John Soderberg.** Delegates: **Walter Denney, Bill Neill, Bill Safranek.** Alternates: **Dick Jaeger, Bill Shriver, Earl Shaner.**

President Elect Shriver thanked the membership for their expression of confidence and hoped the branch would have a very successful year.

George Skelly introduced the speaker of the evening, **Dr. Mars Fontana** of Ohio State University, who presented an interesting talk on a recent trip to study corrosion problems in the oil refineries in the Caribbean area. A short question and answer session followed.

Halvor Christianson
Secretary

DALLAS-FT. WORTH

Cliff Struyk Talks on Fluoborate Plating

New officers took over the reins of our branch, with President **Kirt Kirsten** presiding. Two new members were voted into the membership. Twenty were present.

Secretary **A. C. Fricke** gave a convention report. Discussion was thorough on the instruction of delegates and the necessity for good representation at the convention.

Again we were honored by a good member of the Newark branch, in the person of their President **Cliff Struyk.** Cliff gave us our first introduction to fluoborate plating. The aircraft and electronic men had many questions to pump at our speaker, as their problems are along this type of plating. Cliff was very practical in his talk, giving many examples of plating applications as they have developed over a twelve-year period. Our thanks to **Harry Eisen,** the Houston representative of General Chemical for his ground work in getting Cliff Struyk to come down to Texas.

Branch activities will end for the summer and resume in September.

R. H. Heppel

DAYTON

Dr. Carr Talks at Season's Last Meeting

The Dayton branch held its last meeting of the current season at the Yum-Yum Restaurant. It was a dinner meeting attended by 25 members.

Two new members were accepted; **Robert Fooksman,** sales engineer, Duriron, Inc., and **Lawrence H. Hadlock,** process engineer of Globe Industries.

This being election night, the following were elected for the coming year: **Robert Ruleff,** President; **Holle Leuchauer,** 1st Vice-President; **Jack Baker,** 2nd Vice-President; **Richard M. Clinchens,** Secretary; **Bennie Cohen,** Treasurer; **Byron A. Bowman,** Librarian and **Ralph Collins, John Easton** and **Fred Bauch** as the Board of Managers.

Librarian Bennie Cohen introduced **Dr. Dodd Carr,** Bart Laboratories as the speaker for the evening. Dr. Carr first presented an excellent color movie showing some of their special nickel plating jobs. The title of the film was "A Brighter Tomorrow." Afterwards Dr. Carr discussed "Nickel Plating for Engineering Applications." A lively question and answer period followed. Dr. Carr was given a vote of thanks for his able presentation.

Refreshments after the meeting were through the courtesy of the Branch.

R. M. Clinchens
Secretary

HARTFORD

Art Logozzo Moderates a Panel Discussion

The regular branch meeting was held at the Bond Hotel on May 21 and 40

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members and guests were present. Preceding the meeting a movie entitled "Magnifying Time" by the Eastman Kodak Co. was shown.

To help the members get some answers to specific questions or problems that may have been bothering them throughout the year, a panel discussion was held by a panel of experts with **Art Logozzo** as moderator.

The panel of experts consisted of the following: **Joseph McInerney,** on silver plating; **Arnold Johnson,** trouble shooting in the plating room; **Gene Chapdelaine,** barrel plating, rack making and maintenance; and **George Meriano,** anodizing.

A lively question and answer session took place after which the meeting adjourned for refreshments.

Stanley Platoz
Secretary

INDIANAPOLIS

Plating Class at Purdue; New Officers Take Over

The final meeting of the 1955–56 year was held on May 2 at the Fox Steak House with thirty-two members present. Our President, **Herb Kennedy,** opened the meeting with introductions. Under old business, **Abraham Max** reported that a definite arrangement has been made with Purdue University Extension School in Indianapolis for classes in plating beginning this fall. The course will be for one semester or sixteen weeks. The maximum number to be enrolled will be twenty-seven persons and four hours training will be given each Thursday evening.

One new member was voted into the branch—**Oran J. Sands Jr.,** Columbus, Ind.

A report was given on the branch dinner-dance and educational session. A profitable report was given but final figures will be given at the September meeting. **Hawbee,** general chairman and our president both thanked all the branch who so diligently worked to make this such a success.

Concerning the Tri-State meeting of 1957 of which we will be the host, the post-card tally of preference for place will be French Lick Springs Hotel, French Lick, Ind. **Frederick Anderson** is member of the Tri-State committee and **Les Reynolds** is junior member.

Election of officers was next on the agenda and the following were elected: President, **Marshal Whitehurst;** 1st Vice-President, **Bert Hawbee;** 2nd Vice-President, **Frank Hartwig;** Secretary, **Edna Rohrabaugh;** Treasurer, **John Holland** (elected 1955 for 2 yrs.); Librarian, **Loren Stevens;** Board of Managers: **Roman Bender, Quentin Shockley, Abraham Max.**

Our out going President, Kennedy, turned the gavel over to the new president after he had thanked all the members for the excellent support during the past year. Whitehurst then took over and in turn asked for any comment or suggestions from the branch members as to the coming year. One member, **Shockley,** who had not been present too often during the year because of work schedule conflict, said he thought the branch had certainly made much progress during the past year.

Edna Rohrabaugh
Secretary

LOUISVILLE

The regular monthly meeting was held April 19 at Kapfhammer's Party House, Louisville, with a dinner and eighteen members and guests present.

President **K. C. Reifsteck** turned the meeting over to Technical Sessions Chairman **J. S. Houston** who introduced the speaker **Ezra A. Blount,** Editor of the *Products Finishing Magazine,* Cincinnati, Ohio. The subject was "Impressions of the Japanese Finishing Industry," which was accompanied by slides and narrated by Blount.

Also introduced by Blount were **Gerald H. Poll, Jr.,** Associate Editor and **George E. Hay,** Representative of the *Products Finishing Magazine,* Cincinnati, Ohio.

Considerable discussion followed and Blount was given a rising vote of thanks for a very interesting talk.

J. G. Sterling
Secretary-Treasurer

LOS ANGELES

The monthly branch meeting was held at Rodger Young Auditorium in Los Angeles (preceded by dinner) on Wednesday night, May 9 with 94 members and guests in attendance. We were honored with the presence of two out-of-town visitors, **Dr. Ralph Schaefer,** of the Cleveland branch, and **Richard Crane,** of the Waterbury branch.

At 8:25 P.M. President **L. Truman Stoner** opened the meeting by introducing the above guests, and this was followed by the usual reports given by the secretary and treasurer. First Vice-President **George Magurean** gave a membership report introducing nine new potential members who have handed in their application for review by the board. Two new members, **Milton Weiner** and **Theodore I. Goodman,** were formally initiated by the president and welcomed by the membership.

Our executive committee has come up with two major plans for the year which included (1) a Ladies' Night, possibly in September or December, and (2) another Membership Contest, similar to last year's, except that the prizes would be of lower value.

One of the highlights of the meeting was the announcement of our winning the National Membership Contest, winning the branch membership award, to be presented to us at the Washington, D. C. convention in June.

Librarian **Emmett Babock** introduced the guest speaker for the evening, **Dr. F. A. Lowenheim,** of Metal & Thermit Corp., who talked on "Plating of Tin Alloys." This talk was of local significance due to the electronic and aircraft industries in this area. His talk elaborated

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on tin-zinc, tin-nickel, and tin-copper, along with projected slides, and he touched briefly on tin-lead, tin-cadmium and tin-antimony.

Frank Virgil
Secretary

MELBOURNE

Don Isaacs Speaks on Plating in USA

The meeting opened after a showing of films then the president welcomed **J. Austin,** a visitor from the Adelaide branch. **George Allen** was admitted to membership. The chairman advised members of the impending plant visit to Ogden Industries and the special lecture on May 29 on the Salk vaccine.

Glen Walker introduced the speaker for the evening, **Don Isaacs** of Sydney, who spoke on his impressions of Electroplating in U.S.A. Before beginning his speech Isaacs showed some very interesting colored slides covering natural and industrial scenery in U.S.A. and especially dealing with the Grand Canyon, Niagara Falls, New York and the latest model cars. Isaacs then described his visit to a number of electroplating plants and picked out highlights from what he saw, this included ultrasonic cleaning and nickel plating, use of fume controlling agents on chromium plating tanks, nickel-cadmium coating by fusion of separate electrodeposits and extensive use of bronze as a nickel substitute. The speaker handed around a number of most interesting samples and said that the strength of American electroplating lay in specialization. He considered that Australian job platers were quite competent and that the general standard of decorative plating was as high in our country. After a prolonged discussion period **B. Leslie** moved a vote of thanks.

MIAMI

A New Branch Gets Off to a Fine Start

The first meeting of the Miami branch was called to order by **Ernest Owens** on April 25.

The following officers were thereupon appointed by the group to serve temporarily until plans could be completed for the activation of the Miami branch: President, **Charles Posner;** 1st Vice-President, **M. H. Dent;** 2nd Vice-President, **Ernest Owens;** Secretary, **Charles P. Jenkins;** Treasurer, **George L. King.**

The following members were present and are to become Charter Members of the Miami branch: **George L. King, Charles M. Posner, James N. Gibbs, Jr., Maurice C. Phillips, Kingdon Depew, Charles P. Jenkins, Charles M. Curzio, M. H. Dent, Ernest Owens.**

It was unanimously carried by the members present that the following actions be taken: That the initiation dues will be $5.00. That a membership dues in the amount of $9.00 per year be paid by each member. That the sum of $4.28 capita tax be sent to National Headquarters. That application for Charter to National Headquarters be made as soon as possible and all necessary information forwarded to National Headquarters.

There being no further business with reference to the organization of the Miami branch to be discussed, a motion was made, seconded and unanimously carried that the meeting be adjourned until a tentative meeting date of the last Wednesday of each and every month.

Charles P. Jenkins
Secretary

MISSISSIPPI VALLEY

The Permanent Charter is Presented

The May 16 meeting of the Mississippi Valley branch was held at Tower Restaurant, Moline, Ill.

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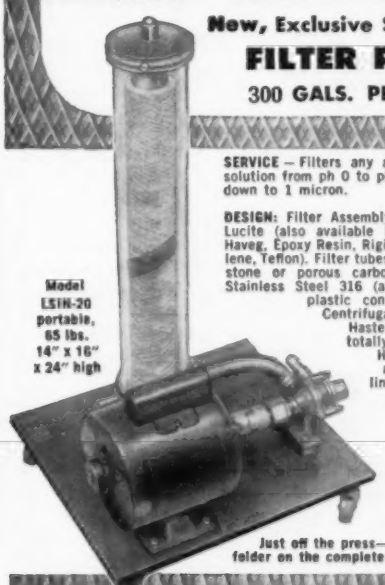

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Meeting and was observed with a dinner-dance with 59 persons in attendance.

After a dinner of roast beef and all the trimmings, **Lloyd Gilbert** introduced our National President, **Clyde Kelly.** Kelly described the workings of the national office and showed color slides of the building and the personnel.

Clyde Kelly, AES Pres., presents Permanent Charter to Lloyd Gilbert, Br. Pres.

Kelly announced that our branch now has 50 members, with **Richard L. Hanner** becoming our 50th.

The presentation of the Permanent Charter was then made to Lloyd Gilbert. The occasion was recorded by photographs.

Gilbert thanked Kelly for the charter and for interrupting his busy schedule to make the presentation. Gilbert then turned the meeting over to our 2nd Vice-President, **Bernard Nordblom,** who showed an interesting movie on Southern California prepared by the Santa Fe Railroad.

Paul Chamberlain
Secretary-Treasurer

MONTREAL

1957 Convention Plans Progress; Rennie on Nickel

The meeting was opened at 8:30 P.M. by **Phil Coady** with 34 members present. Coady asked **John Rennie** to introduce the speaker for the evening.

Rennie then introduced **A. O. Stocker** of United Chromium Ltd. who gave a very clear and concise talk on "Troubles, Causes & Remedies in Nickel Plating." This talk was much appreciated by all present. The speaker was thanked by **J. T. Reisenburg, Sr.**

Report on 1957 Convention was given by **G. R. Davidson** who discussed finances, entertainment and administration in such a manner to indicate that he is at the helm and his Convention Committee is definitely under way. He established the date for the Convention as June 16–19, 1957.

Delegates and alternates for Washington Convention nominated as: Delegates: **P. M. Coady, G. R. Davidson, J. R. Reisenburg.** Alternates: **S. A. Frost, Wm. Feeley, N. Cronin.**

P. M. Coady, chairman of Educational Committee requested suggestions for papers to be read at the 1957 Convention.

The meeting was adjourned at 10:35 PM.

NEWARK

Following the usual Dutch Treat Dinner at the Robert Treat at 6:30 and movies by **Howard Cobb** the May 18 meeting was called to order by President **Struyk.**

A communication from the Robert Treat guaranteed our reservation for the annual Educational Session, December 14, and the Christmas Party December 15, 1956.

Don Foulke read a request from the Technical Societies Council of New Jersey, Inc. asking for suggested topics for their annual meeting and asked that anyone with suggestions contact him, Cliff Struyk or **Dodd Carr** by June 15.

A communication from the National Office requesting assignment of proxy was discussed; and, since Newark was certain that at least three delegates would be on hand, it was moved and passed that no proxy would be assigned and that the delegates should attend the Convention uninstructed.

Four applications were accepted and the following elected to membership: **David Bauman,** Metal Finish, Inc.; **Wm. Du Fosse,** American Electroplating Co.; **Eugene Gut,** B & G Corp.; **James Langen,** H-VW-M Co.; **Albert Ronzo,** Quality Plating Co.

George Reuter reported progress in writing up the Newark branch history and Treasurer **Wagner's** financial report for the year was accepted, after which President Struyk instructed the Board of Managers to audit the books as soon as convenient.

John Banta introduced a resolution commending Dodd Carr and **Gus Bittrich** for their splendid job done in organizing and carrying through to completion the two semesters of the Newark Branch Electroplating Course. The resolution was unanimously passed.

Dodd Carr then introduced **George Reuter** of J. Wiss and Sons who discussed the manufacture and finishing of shears and scissors (under 6 inches). Samples were passed around and at the conclusion of this interesting talk all had a better understanding of these items as well as better judgment as to how to choose good shears.

Dr. E. J. Serfass, Lehigh University, then discussed "Vacuum Metallizing" both from a theoretical and a practical viewpoint in his usual capable manner to the members present. Slides and a number of examples of specialty work done by the Serfass Corporation added to the interest of the subject.

D. Gardner Foulke
Secretary

NEW HAVEN

Rich on Ultrasonics

The May meeting of branch was called to order by President **Austin Jackson.** The roll call of officers was made by Secretary **Bernard Gaffney.**

The applications of **John Arnold** and **Sal Caranno** were read.

A film on "Corrosion" by International Nickel Co. presented by the courtesy of the Lea Mfg. Co. of Waterbury was shown. This film is well produced and narrated, on a subject of interest to all.

The technical speaker was introduced by **Austin Jackson. Stanley R. Rich,** technical director and vice-president of the General Ultrasonics Co., Hartford, Conn. gave a very interesting and illustrative talk on ultrasonics in nickel plating, pickling, cleaning and general use in plating. A question and answer period followed Rich's talk and demonstration.

B. Gaffney
Secretary

NEW YORK

Two Lively Meetings; Two National Officers; and a Talk on Nickel

The meeting was called to order by President **Derick Hartshorn.**

The following candidates were accepted and duly sworn as members of the New York branch: **Carmelo Motta, Barney Forman, Peter Andros** and **Samuel Rothstein.**

Harvey Levine suggested that the branch make provisions for a common laboratory and pilot plant which would be at the disposal of the members. Levine was appointed the head of a committee which includes **Stan Siegel** and **Ted Jordan.** It will be the responsibility of this committee to get a reaction of this plan from the members and then to file a report of its findings to the Board of Managers.

There being no other business, the president turned the chair over to the Librarian, **Joseph Rembecki,** who introduced **Richard Barrett,** the speaker of the night.

Barrett, a member of the Bridgeport branch, spoke on nickel plating from sulfamate solutions. With the aid of slides, he described many of the advantages of the sulfamate bath, making some comparisons with the Watts type and chloride nickel solutions.

At the conclusion of this session Barrett received a rising vote of thanks from the seventy members present, and the meeting was adjourned.

The May 11 meeting was called to order by President Derrick Hartshorn, Jr.

Two new applications for membership were received. Three new candidates were accepted and were duly sworn as members: **Ross F. Consentino, James F. Healy** and **Irving I. Wolkenfeld.**

Milton Nadel announced that the Hotel Statler will be the scene of the annual banquet of the New York branch for the next three years.

There being no other business, the chair was turned over to the Librarian, Joseph

Rembecki, who conducted a question and answer bee. Many of the members participated in this lively session. This period was interrupted, however, by a surprise visit from our National President **Clyde Kelly,** and National Past President **Dr. George Swift,** who were warmly received by the sixty members present.

Anthony P. Briganti
Recording Secretary

PHILADELPHIA
Two Meetings—One the Last Until September

Sustaining Members Night was the feature of the regular meeting at the Engineers Club attended by 75 members and guests on April 23. Representatives of the 13 sustaining members in the Philadelphia area were guests of the branch at the dinner preceding the meeting. **Dr. Samuel Heiman,** AES 1st Vice-President, spoke on Research Committee activities and went over the projects being worked on and the scope of their activities.

Branch President **Trusdell** announced the appointment of **Edward M. Hoffmann, Jr.,** as editor of the Reminder. Also announced were the appointments to the 1956 Banquet committee.

The speaker was **Frank J. Holt,** of DuPont's Electrochemicals Dept., who spoke on "Effects of Impurities in Cyanide Plating Solutions."

Ladies' Night was the feature of the last regular meeting until September held on May 28 at the Engineers' Club. Cocktails and dinner preceded the regular meeting attended by 41.

A motion was passed that our delegates be instructed to seek at the Washington Convention the 1960 Convention for Philadelphia.

A committee was appointed to investigate including a family picnic or outing into the 1956-57 schedule of branch events. Two active members were admitted.

Dr. Samuel Heiman introduced the speaker, **Dr. Richard B. Saltonstall,** The Udylite Corp., whose subject was "Plating in Our Daily Living."

Dr. Saltonstall based his talk around the three topics: How (we plate), Why (we plate) and What (do we plate). He discussed these topics in a nontechnical but informative manner.

I. Wm. Marcovitch
Secretary

PITTSBURGH
A Lively Final Meeting; A Death; Weekly on Zn

The final meeting of the branch was held in the Gateway Plaza restaurant of Pittsburgh's Golden Triangle. Dinner was attended by twenty-seven members.

Following dinner, the business meeting was opened by President **R. Schindler.** The first item of business was the accepting of two new applications for membership. These were for **Richard P. Cope, Jr.** and **Joseph E. Kessler.** Six new members were also welcomed by the branch. They were: **A. J. Chinnici, C. R. Harr, A. J. Jantsch, W. S. McCormick, A. S. Mickelson,** and **S. M. Robertson.**

Myron Ceresa reported to the group on last month's Ladies' Night Banquet which was a huge success with 278 attending. The committee which was responsible for the fine evening was commended by the branch. The committee consisted of **K. Hittle, M. Ceresa,** and **J. Kristofik.**

The death of **Wilfred S. McKeon,** after a lingering illness, was made known. Wilfred was a charter and honorary member of the branch and was always very active in branch activities. He will be sorely missed by everyone.

The installation of officers was conducted by one of our distinguished Past Presidents, **Leo Schmitt, Sr.** before **J. Crain,** retiring librarian, introduced the evening's speaker.

The speaker was **Claude C. Weekly** of Promat Division of Poor and Company. The topic of Weekly's talk was: "Present Practices and Probable Trends in Zinc Plating." Some interesting facts of early plating procedures as well as some developments in future zinc plating were brought out in the talk by the speaker.

After a short stretch, names were

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drawn for free dinners and the monthly door prize. **R. Shindler** was the only winner of a dinner as the others drawn were not present at this dinner. The door prize was won by **D. Porter.** The prize, a set of plastic dishes, was presented by **Russ Reynolds** of the Udylite Corporation. The usual question and answer period followed and concluded the meeting.

Fred Stevens
Secretary

ROCHESTER

The April meeting was held at the 40 & 8 Club on April 16 with Second Vice-President **Fred Thiem** presiding.

A short business meeting was held. Delegates and alternates to the forthcoming convention in Washington on June 17–21 were announced as follows: Delegates: **Frank Beuckman, Linwood Morrison, Edwin Wallin.** Alternates: **Charles Fideor, Wellington Smith, John Hourihan.**

The business meeting was then adjourned and Librarian Frank Beuckman introduced **P. R. Hendrixson,** service manager, Chlorine Products Div., Electro-Chemical Dept., E. I. DuPont de Nemours Co., Inc., Del. Hendrixson presented a very informative and interesting talk on "Vapor Degreasing in Application and Process Control." His speech was supplemented by color slides. After a short discussion period, refreshments were served.

Frederick L. Johnson
Secretary

SAGINAW VALLEY

A Final Meeting; Delos on Waste Disposal

On May 9, the last meeting of the 1955–1956 season of the branch was held in the Colonial Room at Zehnder's Hotel in Frankenmuth, Mich.

After a very fine chicken dinner, and a short business meeting, the principal speaker, **John Delos** of the Ternstedt Division of General Motors, was introduced.

Delos gave a very interesting and informative talk on "Waste Disposal at the Ternstedt Flint Plant." The talk dealt with the problems encountered and methods used to cope with plating wastes from one of the largest plating installations in the world.

After the talk on waste disposal, **A. J. Medwedeff** showed slides of a tour he had taken through western United States. These were enjoyed by all.

Charles Melekian
Recording Secretary

ST. JOSEPH VALLEY

New Officers Installed

Forty-two members and guests of the branch met May 2 at the L. H. Inn, with President **R. Brouwer** presiding. Application for membership for **O. R. Michler** was read, with acceptance to be voted on by the Board of Managers in the near future. **Doyle V. Springer** was elected to membership.

A standing ovation was given **Chester McDowell** of South Side Plating in recognition of his 50th anniversary in the plating business. He has been a member of the AES since 1914.

Pete Peterson, formerly active in the St. Joseph Valley branch, was welcomed back after a five-year absence. Peterson said that he has gone into business for himself during this interval.

Ray Dearth, librarian, introduced the panel of experts: **Donald Morris** of Hanson-Van Winkle-Munning Co.; **John Capuano** of Udylite Corp. and the moderator, **Duke Wysong.** Questions submitted were read by Wysong and the floor was held open to the membership for general discussion.

Duke Wysong closed the questioning period with many thanks to the excellent panel of experts and a rising vote of applause was given by the membership.

The retiring president, Ralph Brouwer expressed special appreciation to **H. J. Wiesner,** Ray Dearth and **Art Wiegand** for their tireless assistance throughout the past year. The gavel was then turned over to **Gene Roth,** the new president.

A Past-President's Pin was presented to Brouwer by Gene Roth. In the short address that followed, Roth expressed hopes of achieving a membership goal of 100 and urged members to work toward this achievement. He also complimented Ray Dearth, retiring librarian, for his interesting presentation of meetings and excellent speakers for the past year. A meeting at the end of May was announced to formulate plans for the 1956–57 programs. L. H. Inn was approved as the meeting place.

The retiring secretary, H. J. Wiesner, invited members to contact him in regards to discrepancies in dues, membership cards, etc., that might arise.

The meeting adjourned, and upon a motion by Art Wiegand, the past president was given a rising vote of thanks for an exceedingly well-done job.

Henry A. Meers
Secretary

SEATTLE-PUGET SOUND

The April 27 meeting of the branch was held at Andy's Diner.

A motion was carried to dispense with the reading of the minutes, and the first business conducted was the election of the Board of Managers for the coming year.

We were honored by having as the speaker of the evening **Dr. Frederick Lowenheim** of the Metal & Thermit Corporation, who held our attention with a summary of the latest developments in Tin Alloy Plating.

A question and answer period concluded the discussion, and the meeting was formally adjourned. An informal discussion of the relative merits of Puget versus Long Island Sound went on among the boating enthusiasts for some time hence.

William P. Foley
Secretary

SOUTHEASTERN

Combs Talks on Chromium

The last meeting of the season was held on May 11, 1956, at the Belmont Steak House, Atlanta, Ga. The meeting was called to order with **Clyde Stovall** presiding, 36 members and guests present. It was announced that our branch had won the 1955–1956 branch membership campaign in the 3rd division. New members were elected as follows: **Justus V. Bellville,** Diamond Alkali Co. and **Harrell E. Patterson,** Carbide and Carbon Nuclear, Oak Ridge, Tennessee, and last but not least, our first "coed" was elected—**Mrs. Jerita D. Wilson,** local Udylite office manager. **Chas. I. Lewis** introduced our speaker for the evening who was **Gene Combs** of Diamond Alkali. Combs gave us an informal informative discussion of "Chrome Plating in Europe and the United States." **Ed Logan** presided in a ceremony for the appreciation of the officers going out and the installation of the new officers.

Robert H. Probert
Secretary and Treasurer

SPRINGFIELD

Officers Installed at a Final Meeting

The Springfield branch met for the final meeting of the season for the installation of officers, and a general good time. The meeting was held at the Mt. View Club in Willimansett, on Thursday, May 24, rather than on the regular Monday meeting night to take advantage of the floor show. After a very good steak or lobster dinner, the installation ceremonies got under way.

Outgoing President **Robert Girard** gave his personal thanks to the membership in general for their wholehearted cooperation during the year, and then gave specific thanks to the following: **Edward Mahar,** librarian; **Henry L. Heissfeld,** secretary; **John "Jack" Costigan, Lawrence "Larry" Fountain,** and **Edward Dupuis.**

Edward Dupuis, as installation officer, swore in **Roger R. Heroux** as President; **Charles F. Griffin, Jr.** as First Vice-President; **Edward J. Mahar** as Second Vice-President; **Henry L. Heissfeld** as Secretary; **George Harold Mongeau** as Treasurer; and **Antonio S. Horta** as Librarian. Also sworn in were **John E. Costigan, Ralph Mongeau, Robert J. Girard, Raymond Howe,** and **William J. Grover, Jr.,** all to serve as the Board of Managers.

Henry L. Heissfeld
Secretary

SYDNEY

Three Meetings are Reported From "Down-Under"

The February meeting took place at the

Trust Bldg. in Sydney with the new President **J. Jones,** delivering his Presidential address. Jones, formerly of Jason Industries in Western Australia, is now plating foreman at Paull, Roberts and Parsons Pty. Ltd. in Alexandria.

The April meeting took place at the same address as above on the twelfth. An address was given by **John Shaeffer** who is a consulting engineer dealing mainly in plastics and had had a number of years' experience in the technology of record making.

The May meeting took the form of a plant visit to Raynors Pty. Ltd.

John E. W. L. Smith
Secretary-Treasurer

TORONTO

Saltonstall Speaks

The March meeting of the Toronto branch was held at the Royal York Hotel on Friday, March 9. Forty members sat down to dinner at 6:30 P.M. Forty-eight members attended the business and educational session.

The speaker of the evening was **Dr. R. B. Saltonstall,** technical director of the Udylite Corporation. Dick spoke on "What Lies Ahead for the Common Metals and Alloys Plated from Aqueous Solutions."

A Great Regional with Many Visitors

The 1956 Regional Convention of the Toronto branch was held at the Sheraton-Brock Hotel, Niagara Falls, on May 5. There were 280 people including members, visitors and wives who attended the Convention.

A technical session took place between 2:30 P.M. and 4:30 P.M. at which **V. L. Richards,** works manager of the Canadian Hanson & Van Winkle Company Ltd., spoke on "Germanium Rectifiers" and **Joe Andrus,** chief chemist of Croname Inc., Chicago, spoke on "Color Anodizing." Both talks were excellent and resulted in lively question periods.

While the technical session was in progress, there was a Fur Fashion Show for the wives at which refreshments were served and door prizes drawn for.

At the finish of the dinner, **John McRoberts,** the outgoing president, introduced the head table and welcomed visitors from the Rochester branch, the Buffalo branch, the Western Ontario branch and the Hamilton branch. **John Smith,** the incoming president, congratulated John McRoberts on the excellent job he had done during the past year. **Mrs. Harold Bunting** thanked the Toronto branch of the AES for the splendid time they had provided for the ladies. Under the direction of **Ray Day,** entertainment chairman, the door prizes, which were donated by the Toronto branch and by the supply houses, were drawn for.

Bob Carpenter's Orchestra supplied the music for the Dance.

John G. Smith
Librarian

WATERBURY

Cleaning is Discussed

The May 10 meeting was held at the Elton Hotel. President **Ted Voyda** presided.

Our program for the evening consisted of a panel discussion on "Cleaning," the panel consisted of the following members: Ted Voyda, Apothecaries Hall Co.; **Bill Innes,** MacDermid Inc.; **Bob Tiers,** W. D. MacDermid; **Bert Sage,** Mattacuck Mfg.; **Bob Johnson,** Scovill Mfg.

They spoke on what was new in the industry and a question and answer period followed. The meeting was well attended.

Nicholas A. Topazio
Publicity Director

WESTERN ONTARIO

A Stimulating Talk by a Yankee

A regular dinner and educational meeting was held by the Western Ontario branch on March 16, at 7:00 P.M., in the William Pitt Hotel, Chatham, Ontario. The guest speaker was **Malcolm M. Maynes,** sales engineer of the Norton Company of Worcester, Mass.

Alex V. Corbit
Vice-President

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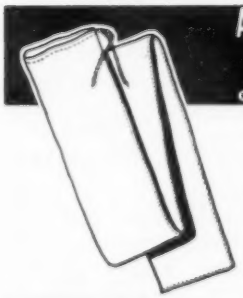

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FUTURE MEETINGS

AES

May 19-22, 1958—45th Annual Convention of the AES, Sheraton-Gibson Hotel, Cincinnati, Ohio.

INTERSOCIETY

August 6-8—Society of Automotive Engineers, West Coast Meeting, San Francisco, California.

August 21-24—1956 Western Electronic Show & Convention, Pan Pacific Auditorium, Los Angeles, Calif.

September 10-12—ASME Fall Meeting, Denver, Colorado.

September 16-22—ASTM Electroplating Practices Symposium, West Coast Meeting, Hotel Statler, Los Angeles, California.

September 16-22—2nd ASTM Pacific Area National Meeting, Hotel Statler, Los Angeles, California.

September 17-21—ASME & Instrument Society of America, exhibit and joint conference, N. Y.

September 25-27—1956 Trade Fair of the Atomic Industry, Navy Pier, Chicago.

AES Branch Directory

(Changes Only)

HOUSTON meets third Tuesday of each month at 7 P.M. in the Ben Milam Hotel, Houston, Texas. Secretary-treasurer, Ralph Marz, 2903 W. Dallas, Houston, Texas.

LANCASTER meets second Friday of each month at 8 P.M. September, December and April meetings are held at Hanover, York and Harrisburg, respectively; all other meetings at the Old Mill Inn, Lancaster, Pa. Secretary, C. Miller, 821 East Mason Ave., York, Pa.

St. LOUIS meets second Wednesday of each month at 6:30 P.M. at the York Hotel, 6th and Market, St. Louis. Secretary-treasurer, Ward W. Kelly, 7046 Deerpath Drive, St. Louis, Mo. Research finance committee chairman, Wm. George, 2331 Barns Ave., St. Louis 14, Mo.

SEATTLE-PUGET SOUND meeting place temporarily, as announced. Third Tuesday of each month at 8 P.M. at the Stewart Hotel, Second and Stewart, Seattle, Wash. Secretary Wm. P. Folly, 3674 Fourth Ave., South, Seattle 4, Wash.

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SALESMEN WANTED—Situation open—Distributors, jobbers and manufacturers agents wanted to distribute and sell a full line of chelating agents to the electroplating industry. All territories open. Reply to Box Jy1, PLATING, 445 Broad St., Newark 2, N. J.

PLATING SUPERINTENDENT—Age 39. Two years college (Chemical Engineering); 19 years plating experience with past 5 as superintendent. Experience includes 3 years hard chrome plating, 5 years electropolishing and 9 years of strip steel plating. Thoroughly familiar with steel mill operations. Reply to Box Jy2, PLATING, 445 Broad St., Newark 2, N. J.

WANTED—Top management position by high calibre man in large job shop or manufacturing plant, mid-west preferred. Completely experienced in production plating. Salary plus bonus in $15,000—20,000 range. Real tough job wanted preferably in shop that needs rebuilding. Opportunity wanted to become part owner eventually. Reply to Box Jy3, PLATING, 445 Broad St., Newark 2, N. J.

METAL CLEANER SALESMAN—We need experienced, successful technical sales representative with proven sales record for expanding sales program. Must know plating, phosphating, porcelain enamelling, other finishing. Liberal draw, commissions, expenses, car, other benefits. Write age, experience, income requirements, territory preferences. Reply to Box Jy4, PLATING, 445 Broad St., Newark 2, N. J.

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Above photograph shows a section of the Sel-Rex engineered gold and silver plating department of U.S. Components, Inc., New York City. U.S. Components, Inc. is one of the leading producers of quality controlled components for manufacturers of communications, computers, aircraft, guided missiles, portable equipment, instrumentation, and test apparatus.

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Sel-Rex BRIGHT PRECIOUS METALS PROCESSES have unique features which make them ideally suited for the exacting requirements of electronic and electrical industries. Sel-Rex BRIGHT GOLD is particularly desirable because it produces a mirror-bright finish directly from the bath—regardless of thickness requirements. Economical, too, for one gram does the job of 2 grams of conventional 24K gold.

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Sel-Rex Precious Metals, Inc.
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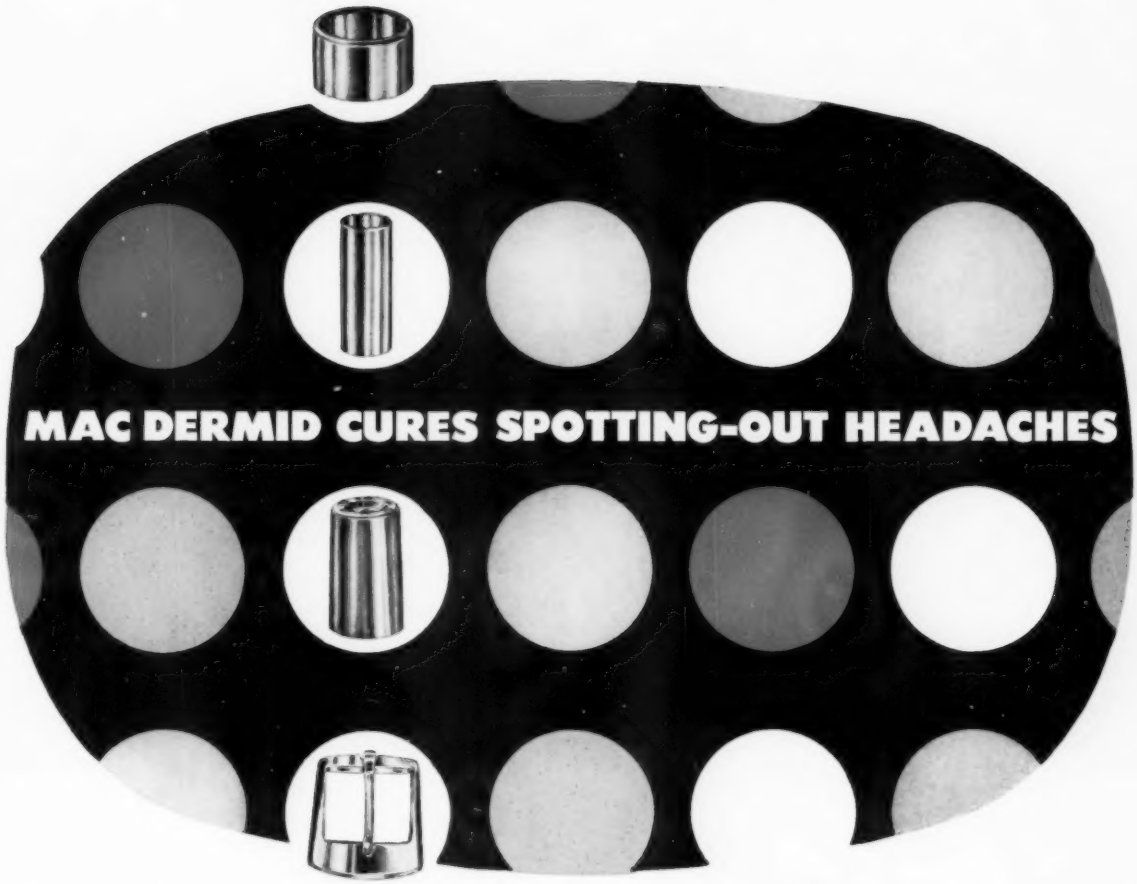

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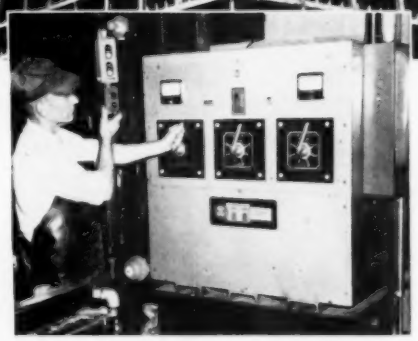

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